

# PSV5000

## Owner's Manual

### Automated Programming and Handling



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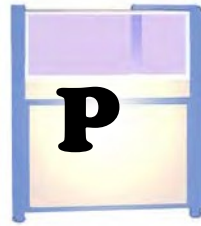
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# Preface

This chapter covers

- Using this Manual
- Safety symbols and symbols for specific equipment
- Contact information
- Service information

## Using this Manual

Knowing the conventions used in this manual helps make it easy find information, as well as to make the PSV5000 machine easy-to-use and keep the operator safe.

## Warnings and Cautions

Special paragraphs with red lines are safety warnings as follows:



Definition of a Warning.

**WARNING:** A warning message like this 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:** A caution message like this has black text and 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

Safety symbols in this manual mean this:



Crush Point (Pinch Point) Warning  
Crush (punto de pellizco) DVERTENCIA  
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 85 db  
ADVERTENCIA de ruido; puede ser más de 85 decibeles  
Crush (Prise Punkt) Warnung



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




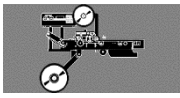




Compressed Air Warning  
ADVERTENCIA de aire comprimido  
Druckluft - Warnung



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

## Symbols for Specific Models & Options

The following symbols appear in the side bar next to paragraphs or procedural steps that are limited to a specific model or piece of optional equipment. If the symbol is next to a heading, the entire content under that heading is limited to the equipment indicated.

This Symbol Means...	Adjacent information is limited to this optional equipment:
	Tape-In Module (Tape Feeder)
	Only Tape Output Systems
	Only Auto - Tray Feeder
	Fiber Laser Marking System.
	FlashCORE (FC) programmers
	Lumen™X (LX) programmers

# Precautions for Safe Operation

PSV5000 has many safety features designed to make the system safe and efficient to operate. **The system can be dangerous if the safety precautions and features are ignored.**

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



## WARNING:



Pinch hazard.  
The E-Stop does not turn off air.  
Socket  
Actuators can still move down when an E-Stop is pushed—and even when Safety doors, are open.  
Use caution.

## Precaution List

### GENERAL PRECAUTIONS

- Do not use the PSV5000 System for any purpose other than its intended use.
- Personal injury could be caused from high leakage electrical current from the main power cable. An Earth (ground) connection is essential before connecting power.
- Do not operate the system if the safety doors and shields are not in their normal operating positions.
- Do not operate the system when any of the cabinet panels (sheet metal) are removed.
- Do not operate the PSV5000 System unless you have been thoroughly trained and have read and understand the instructions in this manual (or the Operator's Manual), particularly those that describe the system's safety features (Safety Systems on page 12.)
- Do not disable or attempt to defeat any of the safety features of this system. Serious personal injury and equipment damage can occur if any safety systems are disabled. If you suspect that a safety feature of the system is damaged or malfunctioning, stop using the PSV5000 immediately and contact your local Data I/O Support representative.
- Do not place any part of your body near moving machine parts.

### REPAIR PRECAUTIONS

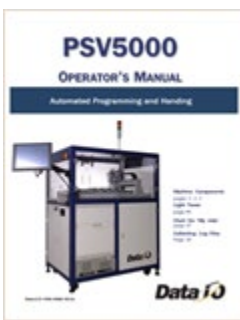
- Only **qualified personnel** trained by Data I/O should install, maintain, repair, or troubleshoot the PSV5000 Systems.
- Do not operate a system while servicing, replacing, or adjusting any component unless directed to do so in this manual. Make sure that the system is properly **shut down before servicing**, replacing components, or adjusting components.
- Disconnect the **external air** before servicing pneumatic parts.



## OPTIONAL EQUIPMENT PRECAUTIONS

- Use extra caution when using the **Tape Input module (feeder) or the Tape Output module** options. The PSV5000 safety doors do not fully enclose them. It is possible that hands, hair, or loose clothing could get caught or pinched in these mechanisms.
- Read and heed the **laser vacuum filter disposal requirements** described later in this section ([Laser Safety on page 27](#)). Always dispose of any other hazardous or residual by-products of the production process in accordance with governing laws and regulations.

## Jump Right In



Basic *operating* instructions are in a separate manual in hard copy format as well as PDF on the Handler computer.

Thanks for reading about the safety symbols, notes, and icons. If your PSV5000 System is already set up and you want to skip ahead:

Be safe —see [Safety Systems on page 12](#).

Where's the \_\_\_\_? —see [Machine Components on page 19](#)

How to run a job —see the separate PSV5000 [Operator's Manual](#).

What if it stops? —see [Troubleshooting on page 131](#)

What info is needed when I request service? -see next page.

# Contacting Data I/O

Contact Data I/O for technical assistance visit [www.dataio.com](http://www.dataio.com) and click the **Technical Support** button. Log-in to our Support Portal. For first time use, we recommend that customers enter a generic user name and email for a distribution group so that multiple people in your company can access Data I/O Service requests.

To help us give you quick and accurate assistance, please provide the following information:



For Serial Number location see Figure 10: on [page 22](#).

Machine serial number

- TaskLink and CH700 software version numbers
- Job Runner or Job Creator software version numbers if applicable
- Type of programmer (FlashCORE or LumenX)
- Detailed description of the problem you are experiencing
- The event log from the FlashCORE programmer site
- Error messages (if any)
- Device manufacturer and part number (if device related)

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**Note:** For later versions of this manual, check our website *Technical Library*.

---

## Data I/O Customer Support



Want to contact **Sales**?

USA–  
salesDIOAmerica  
@dataio.com

China–  
ChinaSales@dataio.com

Germany–  
salesgmbh@data-io.de

The best way to contact technical support is by logging in to our online Support Portal: visit [www.dataio.com](http://www.dataio.com) and click the **Technical Support** button.

### WORLDWIDE: [WWW.DATAIO.COM](http://WWW.DATAIO.COM)

Data I/O Corporation Redmond, WA USA 98052  
Telephone: +1 425-881-6444 in USA: 1-800-3-DATAIO  
Fax: +1 425-867-6972  
email: [support@dataio.com](mailto:support@dataio.com) (our Support Portal, above, is preferred)

### CHINA: [WWW.DATAIO.CN](http://WWW.DATAIO.CN)

Data I/O Co. Ltd email: [support@dataio.com](mailto:support@dataio.com)  
(our Support Portal, above, is preferred)

### GERMANY: [WWW.DATAIO.DE](http://WWW.DATAIO.DE)

Data I/O GmbH email: [support@dataio.com](mailto:support@dataio.com)  
(our Support Portal, above, is preferred)

## OTHER COUNTRIES

Data I/O Customer Support offices around the world are staffed with factory-trained technicians to provide prompt, quality service. For warranty service, contact Data I/O Customer Support at the numbers listed at our Rep Search on our website.

To find your local Data I/O representative on our website, click **Technical support > Representative Search**.  
<http://www.dataio.com/Contact-Us/Representative-Search>

## Warranty Information

Data I/O Corporation warrants this product will be free from defects in materials and workmanship for one (1) year from delivery.

This warranty and any third party warranties are in lieu of all other warranties, expressed, implied, or arising under law, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

## Repair Service

After the warranty period expires, Annual Service Agreements are available. As the end of your warranty period approaches, our sales group will contact you with the Service Agreement options.

Repairs to systems or sub-assemblies that are not on a service agreement will typically be charged for labor and material costs.

For more information or to order a Service Contract, call Data I/O Customer Support at the numbers listed — See “Contacting Data I/O” on page - 6 -.

## Change of Address

If your address has changed, please notify Data I/O Customer Support. This ensures that you receive information about product enhancements. Be sure to include the machine model and serial number.





# 1 — Chapter One

---

## Introduction

This chapter describes PSV5000 and its components, software, safety and room considerations.

The Automated Programming System (PSV5000 System) is a versatile production programmer that handles and programs devices in traditional and fine-pitched packages. These include BGA, FPGA,  $\mu$ BGA, QFP, TQFP, CSP, TSOP, SSOP, SON, WSON, SOIC

Device technologies supported include NOR and NAND Flash, Micro Controllers, Serial EEPROM, and the latest e-MMC memories.

The modular design of PSV5000 creates flexibility, allowing you to optimize to the level of production required by your facility.



The *PSV5000 System* refers to the machine, accessories, and the software. The word *Machine* is used to mean the physical machine, not the software. For example, you might connect an air supply hose to the Machine, but change programming jobs on the PSV5000 System.

## Snapshot of PSV5000



**Figure 1: Features of PSV5000.** For a more detailed image with components labeled, see the Operator's Manual. For component descriptions see *Component Descriptions* on page19.

## Setting the Language

Several other languages are available for the application interface. To change the language, edit the C:\CH700\winAH400.ini file as follows:

1. Open the ini file in Notepad or UltraEdit. (Do not use Microsoft Word or other word processor.)
2. Find “Language Settings” section.
3. Add a semicolon to the line for the current language.
4. Remove the semicolon from the line for desired language.

```

;----- Language Settings-----
;Default language is English 1000
;LangId=0 ;German
LangId=1000 ;english
;LangID=2000french
;LangID=3000spanish
;LangID=4000danish
    
```

**Figure 2: Sample from the winAH400.ini file. The language in this sample is set to English.**

5. Save the file.
6. Restart CH700 Software for the changes to take effect.

# System Description

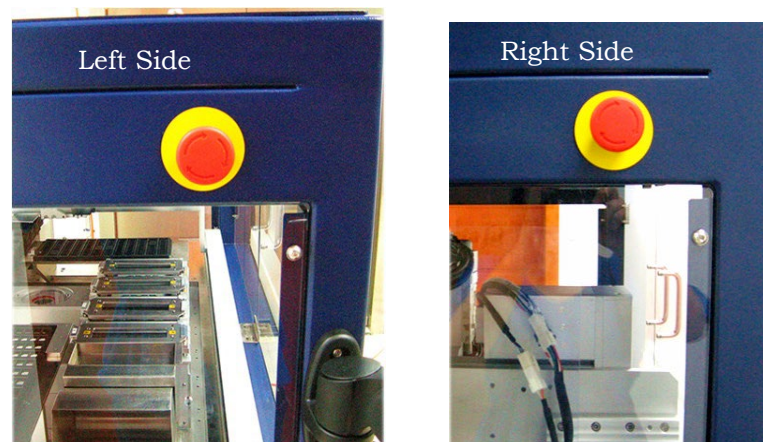
## Safety Systems

The PSV5000 System moves devices from input media through a programming and optional marking process to output media for delivery to the next phase of the production process. The machine includes a grounding connection to prevent static electricity (ESD).

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 Marking 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 either side of the machine. When an E-Stop button is pressed, the gantry stops moving immediately. See caution notice below.



**Figure 3: Two Emergency Stop (E-Stop) buttons.**



**WARNING:** Shock hazard! Pressing an E-Stop button removes power from the motion controller (gantry) only, and power off the Laser Marking Module. It does not remove electrical power from PSV5000 or any optional equipment installed. Turn the main power OFF before opening metal doors.



**WARNING:** Pinch hazard! The E-Stop does not shut off air.



Socket actuators can still move down and up

---



**Park Position:**

The spot where the head stops when a job is paused or ended (near the far right corner).

**Home Position:**

The far right corner of the workspace where the head travels to before each job is started.

**Tool Position:**

Near the safety door for easy access to the PNP head.

**SAFETY DOOR WITH INTERLOCKS**

During operation, when the high-speed PNP head is processing devices, the clear plastic doors at the workspace are closed to protect operators from injury. Both doors have a safety interlock which stops gantry movement if the operator forgets to first park the PNP head.

Normally, if the power is ON, the PNP head should be stopped in the park position prior to opening a safety door.



**WARNING:** Possible collision hazard! The high speed and force of the gantry can seriously harm anyone working inside the workspace. When working within 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. Ensure that a job is Paused or Finished, or the system power is OFF prior to opening any safety doors.

---



**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.

---



**CAUTION:** Possible product damage! Do not use solvents such as acetone, lacquer thinner, mineral spirits, isopropyl alcohol, or any type of abrasive compound on the safety doors. These products will damage the safety door surfaces and ESD coating, and reduce visibility of the work area.

---

**ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS**

Devices (integrated circuits) are very sensitive to static, and could be damaged by unintended electrostatic discharge while being handled. The most effective way to prevent damage from ESD is to make sure 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, also called a vacuum 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.

To pick up a device using the vacuum tools use a squeezable air bladder for suction. There are a variety of models, sizes and tips. Some tips are replaceable.



**Figure 4:** A Vacuum Tweezer, Data I/O PN 565-8000-001.



### [LASER MARKING ONLY] FUME EXTRACTOR

Used with the Laser Marking option, the laser fume extractor removes harmful smoke and hazardous materials from the marking area and safely stores them for proper disposal.

**Note:** Refer to Laser Safety on page 27 for more information. For maintenance, see Laser Marking Fume Extractor on page 126.

## Machine Axes

The PSV5000 System gantry operates on three primary axes: **X**, **Y**, **Z**. An additional axis, called the **R-axis** (*theta*), is used by the PNP head to change device orientation (rotation).



**Figure 5:** These axes describe motion direction on the PSV5000. The X-Y coordinate 0, 0 is at the left front corner.

## Basic Machine Functions

The PSV5000 System combines a device programming system and a high-speed pick and place head (PNP head) to provide rapid programming of standard pitch devices, as well as ultra-fine pitched devices.

TaskLink™, or Job Creator or Job Runner software, and Automated Handler software (CH700) running on the system's Handler Computer direct the PSV5000 System to perform a series of processes, including automatic handling, programming, marking, and placement of devices to the output media of your choice.

The PSV5000 System performs these basic operations when processing devices:

**1. Pick devices from the input media—**

The pick and place head (PNP head) unloads devices from the input tube, tray, or tape module. These devices are placed into programming sockets in all cases except when Ignore Programmers is selected, in which case the head takes devices directly to a different media (repackaging only) or to the shuttle for marking only.

**2. Process devices—**

Devices in the programming sockets undergo any or all of the following processes as determined by the job. These processes are set in TaskLink:

- Continuity check
- ID check
- Erase
- Blank check
- Program
- Verify programming
- Read
- Illegal-bit check
- Functional verification operations
- Secure device
- Verify options such as voltage

(Optional) Mark devices—

When available, devices that pass the programming and verification operations are marked at the Laser Module for identification.

### **3. Load devices into the output media—**

Devices are moved by the PNP head to output media: trays, tubes, or tape. Devices that fail one of the programming processes are placed into the reject bin or reject tray.

## **Input and Output Options**

PSV5000 System input and output options are: static tray (manual), tray feeder (automatic), tube, and tape.

Most combinations of input and output options may be used. For example, the PSV5000 System can be configured with input as static tray and output as taped.

## **Manuals for Optional Equipment**

The manuals that came with any optional equipment on your system contain additional, more in-depth information. Some of the manuals came in hard copy format with your PSV5000 System. Others are PDFs installed on the Handler computer.



**Figure 6: Some of the optional equipment manuals, from left to right: Laser Marker; Automatic Tray Feeder CB (Tray Stacker).**

## PSV5000 Specifications

Specifications are without optional equipment.

FACILITIES	
Supply Air Pressure	clean, dry, oil - free air at 5.5–8.2 Bar (551–827 kilopascals) (80–120 PSI)
Air Flow	85 liters/minute (3 CFM) maximum air flow
AC Input Voltage	208–240 VAC, single phase
AC Input Frequency	50–60 Hz
AC Input Power (max)	15 Amps (with all options)

PSV5000 DIMENSIONS	
Length, x-axis (including monitor) <sup>1</sup>	130 cm (51 inches)
Width (including monitor) <sup>1</sup>	87 cm (34 inches)
Height: machine (doors closed) then add [light tower]	153 cm (62 inches) + [56 cm, 22 in.]
Weight (no optional equipment), approximate	450 kg (1000 lbs.)

Environment	
Operating Temperature	+13° to +32° C (+55° to +90° F)
Hours required for temperature stabilization	8 hours after transportation
Relative Humidity	35% to 90% non - condensing
Sound level	75 dB or less

OTHER	
Handler PC Operating System	Windows 7 OS, 32-bit
Monitor	15 inch TFT Touchscreen

<sup>1</sup> Since the monitor arm rotates, length and width dimensions can be adjusted inversely, up to 10 cm (4 inches). For example, if you subtract 10 cm from length, then add 10 cm to width.

# Machine Components

The PSV5000 System has many components, or subassemblies, that work together. Refer to the figure below to locate primary components.

## Safety Systems

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### LIGHT TOWER

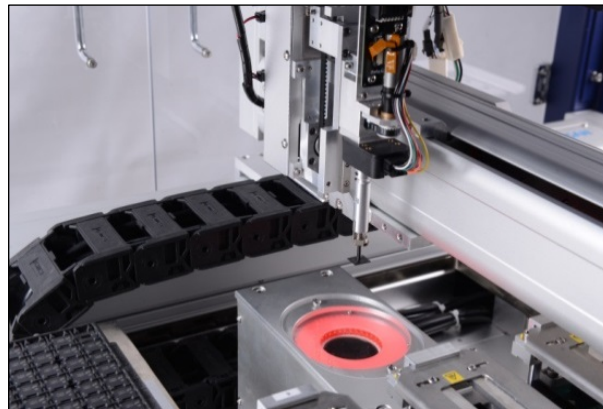
Allows monitoring the status of the PSV5000 System from a distance while the system is processing devices. See *Light Tower Interpretation* in the *Operator's Manual* for a complete description of lamp colors and significance.

### GANTRY

Travels along X- and Y-axes moving the PNP head to different locations within the work envelope. It moves devices in four axes,

**X, Y, Z, and R.**

The PNP head uses different sized probe tips to accommodate the great number of device types that are available. See *Installing the Correct Probe* in the *Operator's Manual*. During operation, vacuum at each probe holds a device. Vacuum sensors detect whether or not a device is present on a probe tip.



**Figure 7: The PSV5000 PNP head.**

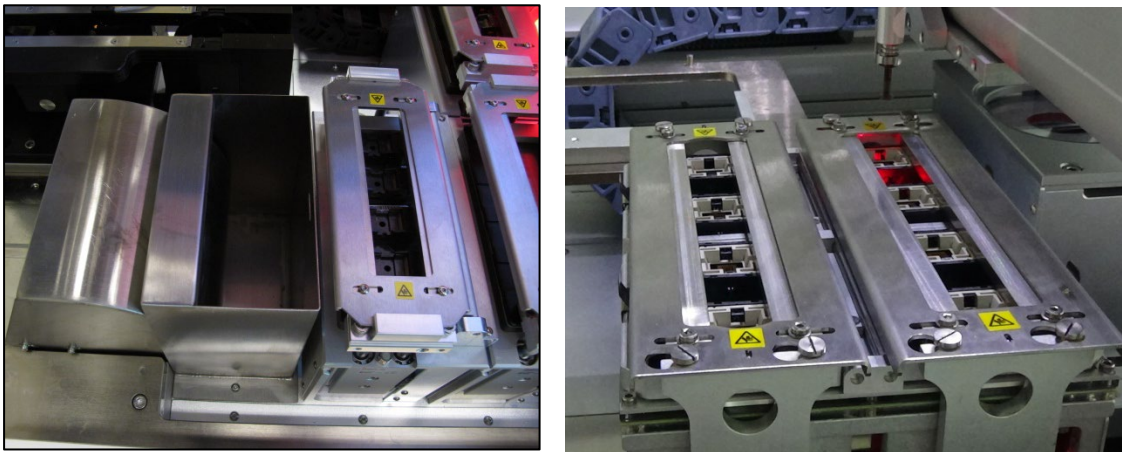
The probe picks up a device and moves it to a programming socket. To place devices at target locations, a probe lowers, vacuum is turned off and blow-off air is momentarily turned on.



**WARNING:** Collision hazard! The gantry system and associated components move with high speed and force, and have the potential to cause great bodily harm. Do not bypass the safety interlocks or operate the with the safety doors open or removed.

### PROGRAMMERS

Data I/O's FlashCORE III programming modules are used in many Data I/O products and have most algorithm support. LumenX programmers are one of the fastest programmer architectures currently available. Programmer Modules in the PSV5000 include pneumatic socket actuation.



**Figure 8: Left: A FlashCORE Programmer (next to the reject bin), and Right: a LumenX Programmer.**

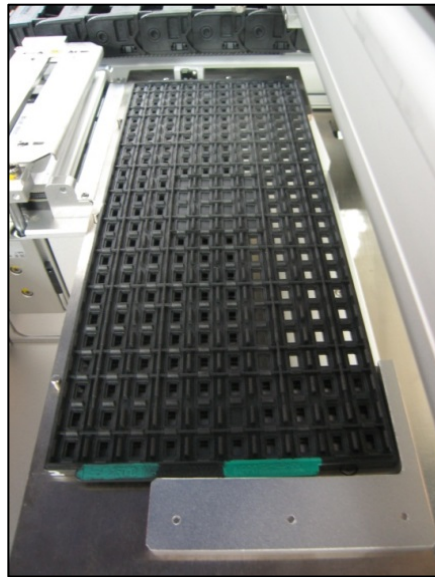
### VISION SYSTEM

PSV5000 uses an upward camera for precise picking and placing.

### STATIC TRAY MOUNT

Using positioning pins and a magnetic bracket, JEDEC and non-JEDEC standard trays are held firm for the PNP head to pick devices and return them after processing.





**Figure 9:** A typical Static tray installation. Note that the beveled corner is at the far left, adjacent to the sensor.

### HANDLER COMPUTER

The on-board Handler computer hosts TaskLink software and the CH700 software, and monitors all sensors. The computer contains a CPU that runs Microsoft Windows 7 Operating System (at time of release).



**CAUTION:** Possible machine damage! Adding software to the PSV5000 System can cause damage or cause the system to operate improperly. Adding software without specific instruction from Data I/O Customer Support will void the warranty and may incur service charges if subsequent service is required.

### KEYBOARD AND TOUCH SCREEN

Both methods of input are available for operation. With the touchscreen, tap the screen with a finger only, not sharp objects such as pens or pencils.

**Note:** Throughout this Owner's Manual, the term **click** is also used to mean **tap** when using the touch screen monitor.

### ESD STRAP CONNECTION

When operators plug an antistatic wrist strap into the ESD strap connection, it reduces the risk of damage to devices and Socket Adapters from electrostatic discharge (ESD).

## SAFETY DOORS

Designed to protect against injury and damage from the PNP head movement, the safety doors are an important safety feature, stopping the gantry when they are opened.

For more information see *Safety Door with Interlocks* on page 22.

## POWER PANEL

The Power Panel is on the lower left side of the machine.

## CONNECTIONS

The Power Panel allows for the attachment of AC power and air.

Optional connections:

You can connect an Ethernet cable for internet connection

## CONTROLS

Mounted on the Power Panel are the main power switch and the main air regulator and filter. There is a second regulator with a separate gauge for adjusting socket opener pressure. See *Adjusting the Socket Actuator Air Pressure on the Programmers* on page 99.



**Figure 10: Power Panel (Facilities Panel) on the back of the machine.  
The Serial Number is there, also (arrow).**

## Optional Equipment Descriptions

### CIRCUIT BREAKERS

There is a toggle switch on the power panel which allows shutting off power to only the programmers.

Numerous hardware options can be purchased with PSV5000, most of which are the various input and output modes. The non-input/output option is laser marking for devices.

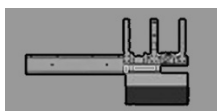
### LASER MARKING DEVICES



The Laser Marking System uses a compact Laser to mark devices. The laser applies a customer-defined mark. *MarkingMate* is supplied with the laser for creating marking files. 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.

For additional safety information, see *Laser Safety* on page 27.

### (OPTIONAL) AUTOMATIC TRAY FEEDER



Designed to automatically supply trays full of devices to the PSV5000 System, the Tray Feeder CB accepts up to twenty thin or thick JEDEC trays.

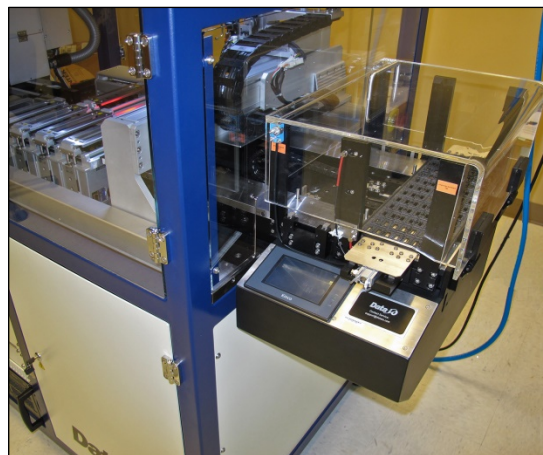


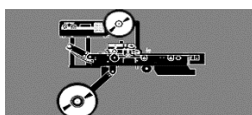
Figure 11: The Tray Feeder.

### (Optional) Tape Input Module



The tape input module is a mount and communication accommodating a chip feeder which provides devices for programming. Use the appropriate size tape width/feeder. Each device is picked from a carrier tape pocket and placed into a programming socket.

### (Optional) Tape Output Module



The tape output module, mounts onto the left side of the machine and uses a reel of empty carrier tape to hold devices after they are programmed. It supports all widths. Programmed devices are placed into

empty pockets on the carrier tape. The carrier tape advances through either a heat seal or pressure seal unit that applies cover tape to the carrier tape.

# Software

Software resides in the Handler Computer. The primary log-on for the Handler Computer is Microsoft Client. The current operating system (at time of this publication) is Windows 7.



**CAUTION:** Possible machine damage! Adding software to the PSV5000 System can cause damage or cause the system to operate improperly. Adding software without specific instruction from Data I/O Customer Support will void the warranty and may incur service charges if subsequent service is required.



**CAUTION:** Possible machine damage! Microsoft Windows system parameters and network parameters should not be changed unless instructed to do so by Data I/O Customer Support. Changing parameters can cause failure and/or damage to systems or cause improper programming.

## SUPPLIED SOFTWARE

The PSV5000 System should never have other software added without consulting with Data I/O Customer Support.

## ANTIVIRUS SOFTWARE

Customer-supplied antivirus software can be installed on the Handler Computer and is recommended.



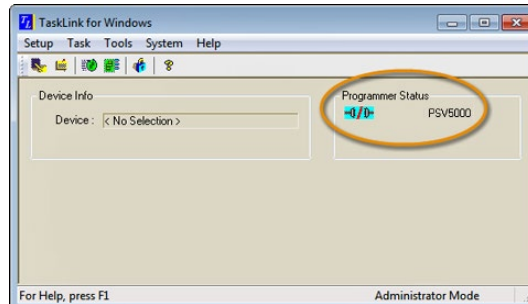
**CAUTION:** Possible loss of support or time! Check with Data I/O Customer Support to ensure that your software is compatible with the programming system, otherwise the warranty may be voided. Ensure that the antivirus software does not scan during a job run.

## STATISTICAL PROCESS CONTROL SOFTWARE

Customer-supplied Statistical Process Control software can be installed on the Handler Computer. See *Statistical Process Control Software* on page 73 for more information.

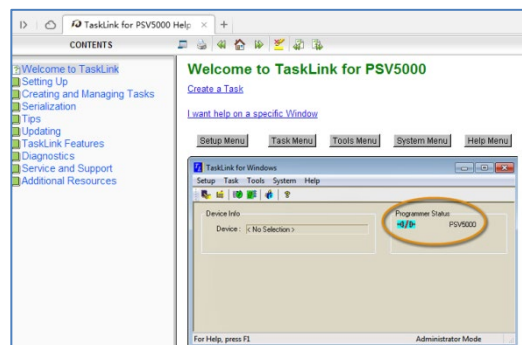
## Job Creation Software for FlashCORE

TaskLink™ for Windows® is Data I/O's versatile application for creating jobs to run on the PSV5000 System with FlashCORE programmers. TaskLink resides on the Handler Computer.



**Figure 12: TaskLink's main window displays the selected programming system. Jobs created or edited will be for this system.**

TaskLink online Help is available by clicking Help > Help Topics. It offers procedural steps as well as general information.



**Figure 13: TaskLink online Help. It includes update instructions.**

## Job Creation Software for LumenX

Job Runner and Job Creator are Data I/O's latest applications for creating and managing jobs to run on the PSV5000 with LumenX programmers. The software resides on the Handler Computer.

## Updates and Algorithm Support

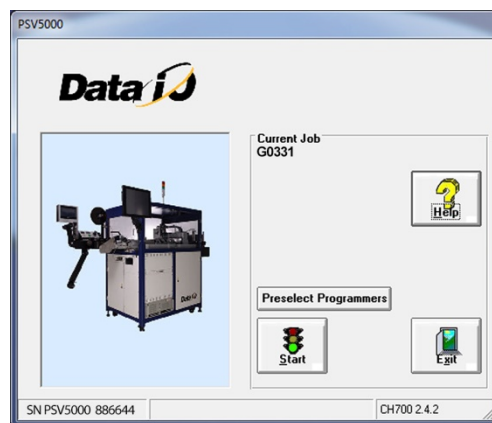
Updates, includes algorithm updates, are generally acquired through our APS Agreement (Annual Programmer Support). See *APS Agreement*

on our website under the SUPPORT tab. For more information, see TaskLink online Help or Job Runner/Job Creator online Help.

## CH700 Application

Data I/O's Automated Handler software is a Microsoft® Windows®-based application for setting up and programming integrated circuits (devices) on PSV5000 Systems. It offers a selection of many PSV5000 System options such as input/output configurations, labeling options, and statistical feedback methods. The CH700 application software resides in the Handler Computer.

For updates to CH700 Software see [Software and Firmware](#) on our website under the SUPPORT tab. Then look for PSV5000 under *Download the Latest Firmware*.



**Figure 14: CH700 Start-up window for PSV5000.**

## Laser Software



The Laser software is a Windows-based application that allows creating parameters required for laser marking jobs as well as initiating laser marking. This MarkingMate software is on the Handler computer.

When the Laser Marking System is set up and initialized, it receives commands from the CH700 which starts the marking sequence.

For more information please refer to the MarkingMate software help.



For more information about the Laser System, see *Setting Up the Laser Marking Module* on page 55 and *(Optional) Creating a Laser Marking File* on page 81.

## Laser Safety

The PSV5000 Laser option is designed in accordance with the following safety guidelines:

- A fume extractor traps marking fumes and other by-products of the laser marking operation.
- The system designed to comply with ANSI, IEC, and CDRH guarding standards.
- Refer to and follow laser and safety precautions in ANSI Z136.1 - 2007, American National Standard for the Safe Use of Lasers. Procedures listed under the Standard include: appointment of a Laser Safety Officer, operation of the product in an area of limited access by trained personnel, servicing of the equipment only by trained and authorized personnel, and posting of signs warning of potential hazards.



---

**WARNING:** Possible eye and skin injury! The laser will fire even when safety doors are open. If equipped with Laser Marking, do NOT interfere with, or work on, the Laser Module while the Laser PC key-switch is ON.

---



## Room Consideration

When planning the space and environment for a PSV5000 machine installation, consider ventilation and access for maintenance and repair.

**Summary**-Regarding ventilation, the minimum room size for any PSV5000 System is 3 x 3 meters x 2.4 meters high (10 x 10 x 8 feet). However, access space for some machines requires a larger room; see Access Space below.

The PSV5000 System, and its optional components, such as a Tape Output System or Automatic Tray Feeder, contains mechanical components and electrical systems that generate heat and extremely low levels of particulate matter.

The room should have suitable levels of general room heating, ventilation, and air conditioning. For an occupied office area, the American Society of Heating, Refrigeration, and Air Conditioning Engineers, Inc. (ASHRAE) Standard 62-1992 specifies a minimum of 15 cubic feet/minute (CFM) (0.424 cubic meters/minute) of air per occupant. This level of ventilation is intended to provide the occupants of the room with sufficient air movement to provide a comfortable environment.

However, because the PSV5000 System generates heat, an additional 85 CFM (2.40 meter<sup>3</sup>/minute) is recommended, bringing the total room air exchange rate to 100 CFM (2.83 meter<sup>3</sup>/minute).

In a room with dimensions of **10 feet by 10 feet, with an 8 foot high ceiling** (800 cubic feet of total interior area), 100 CFM would provide approximately six room air changes per hour. (Metric room: **3.0 M x 3.0 M x 2.4 M high ceiling** equals 22.65 cubic Meters of total interior area).

Based on industrial hygiene monitoring performed during the worst case operating scenario of a PSV5000 System, this rate of air movement is sufficient to provide a safe and healthy work environment regarding air quality.



The air movement is intended to dissipate heat, odors, and other exhalation products from respiration such as carbon dioxide and water vapor.

## Access Space

The PSV5000 Machine should be located in a room with adequate space to allow easy access to all enclosures.

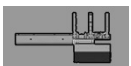
**THE INTENDED AREA FOR INSTALLATION MUST:**

- allow at least one meter (39 inches) of clearance on all sides of the machine for opening access panels as well as repairing and replacing subassemblies,
- provide a solid foundation (for example, a concrete floor). The machine contains a fast-moving gantry with much mass. The area for it must be stable, solid, and mostly level prior to installation. If this is not achievable, consider installing the system at another location.

The table below lists recommended, minimum envelope size determined by the 1 meter access space required on each side:

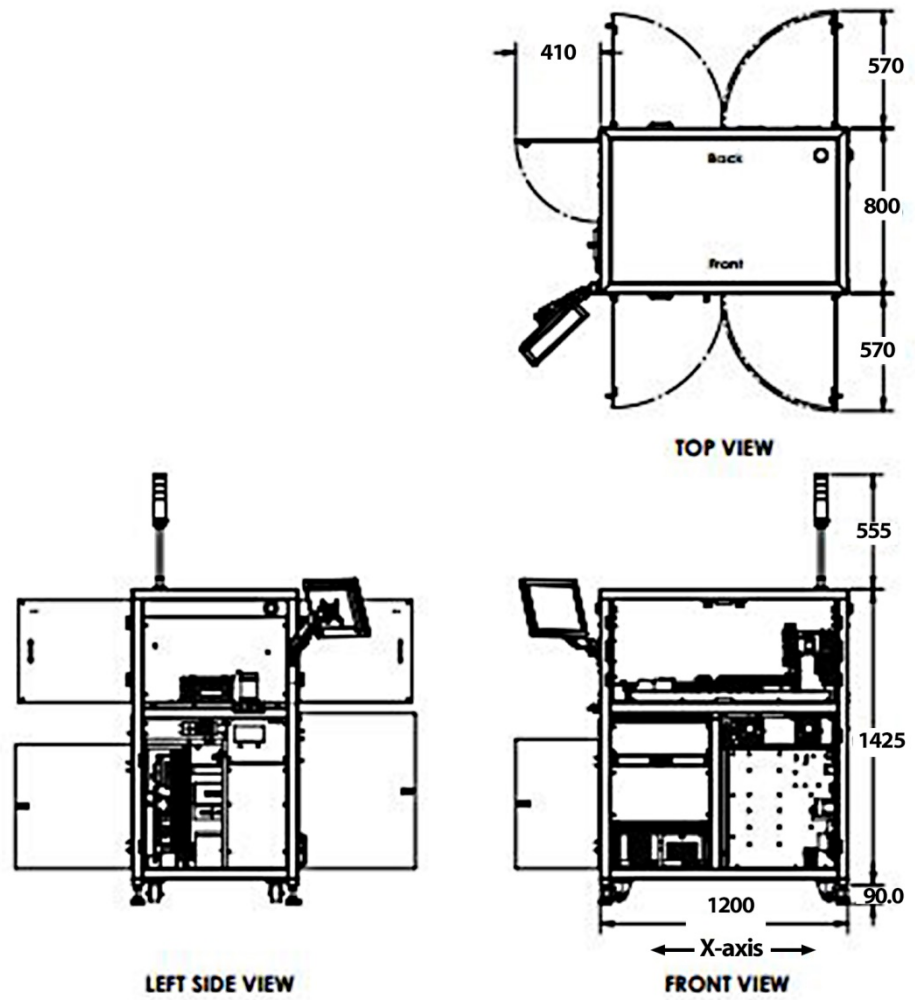
**MINIMUM PHYSICAL ENVELOPE**

**Note:** The numbers below **do not** include ventilation requirements discussed in the previous heading Ventilation.



Machine Configuration	Width x Depth (X-axis x Y-axis)	Width x Depth + 1 m all sides for access
PSV5000 Only	1.5 m x 0.87 m	3.5 m x 2.87m
PSV5000 + Laser	1.3 m x 0.87 m	3.2 m x 2.87m
PSV5000 + Tray Feeder	2.1 m x 0.87 m	4.1 m x 2.87 m
PSV5000 + Tape Out Module with Large reel	2.2 m x 0.87 m	4.2 m x 2.87 m
PSV5000 + Tray Feeder + Tape Out Module with Large reel	2.9 m x 0.87m	4.9 m x 2.87m

For example, a PSV5000 System with a Tray Feeder requires a minimum physical area of 4.1 meters wide x 2.87 meters deep for easy access.



**Figure 15: Maximum envelope of PSV5000 without optional equipment such as marking, Tape-In or Tape Output Modules. (Dimensions in mm. Reduced scale).**





## 2 — Chapter Two

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### Setup

This chapter covers setting up the PSV5000 machine as well as setting up equipment on the machine. This includes optional equipment such as the Tape Output equipment, as well as the various device media choices for running jobs, such as setting up Static Trays or an Automatic Tray Feeder.

### Machine Installation

Installation of the PSV5000 is performed by Data I/O service personnel or an authorized distributor. After the PSV5000 arrives, ensure that there is no damage to the exterior of the crate. Remove the PSV5000 Machine from the crate and inspect for damage that may have occurred during shipping. If no damage is evident, unbolt the machine from the shipping pallet.

For the intended area for PSV5000 installation see *Room Considerations* on page 29.

### Leveling

---

When the PSV5000 is at the desired location, adjust the feet to level it.



**WARNING:** Possible machine damage or personal injury! Instability such as vibrating, walking, or rocking, may occur if fewer than four of the installed feet make suitable contact with

the floor, or if the leg locknuts are not tightened against the frame. Only the adjustable feet provided on the PSV5000 Machine should be used for leveling. Do not use shims to assist in leveling.

## Connecting Facilities

The PSV5000 requires two external services: pressurized air and electrical power. It also allows one optional connection to an Internet via a Network connection. These services connect to the PSV5000 Machine at the Power Panel located on the back of the machine.

With the two required services, the machine creates all the unique electrical voltages needed as well regulating pneumatic pressure for all systems within the machine.

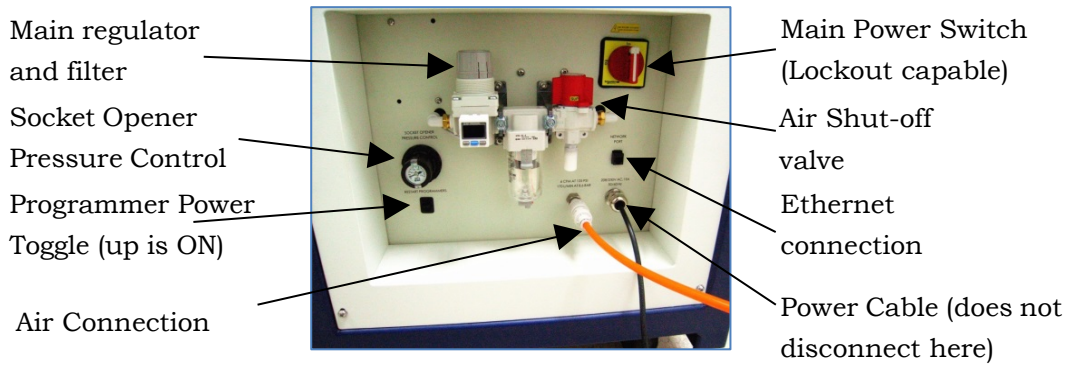
## Connecting Air

The machine requires clean, dry, oil-free air from an industrial grade compressor.

PSV5000 Air Requirements Table

System	Air Volume	@ Air Pressure at inlet regulator on PSV5000	Supply Air	Min. Air Tube Length <sup>1</sup>	Customer supplies a primary filter/regulator required between factory compressor and PSV5000 <sup>2</sup>
—Metric	85 L/minute [.084 m <sup>3</sup> /min],	5.5 ±0.3 Bar	5.5 - 8.2 Bar	3 Meters	10 micron
	3 SCFM constant	80 ±5 PSI	80 to 120 PSI	10 Feet	10 micron
<sup>1</sup> This external air line must allow the supplied air to cool sufficiently so that water vapor in the air condenses and can be extracted. <sup>2</sup> The air filter on the Facilities Panel is a secondary filter only.					

**Note:** If the compressor cannot maintain the correct air pressure and stable air volume, PSV5000 System performance will be affected and may damage devices.



**Figure 16: Power Panel on the back of the machine.**

Connect air to PSV5000 at the main regulator and filter. See [the figure above](#) for the location of the external air line connection.



**CAUTION:** Possible air system damage! Oil, excessive moisture, or poorly filtered air will obstruct the system’s internal air pathways, affect performance, and void the warranty related to air system failure. If oil or excessive moisture is detected, contact Data I/O Customer Support or a local Data I/O approved service representative.

### MAIN AIR PRESSURE GAUGE

The main pressure regulator is set at the factory, but can be changed manually. See *Connecting Air* on page 34 for the factory setting.

When air pressure is within range, the regulator readout is green. If air pressure is above or below the acceptable range, the readout displays red. If it is red (out of range), contact Data I/O Support or a qualified service technician. The upper and lower limits cannot be changed without the password.



If there is low air pressure the monitor may display a message reading No air.

## Connecting Electrical Power



**WARNING:** Electric shock hazard! Personal injury could be caused from high leakage electrical current from the main power cable. An Earth (ground) connection is essential before connecting power.

Required power is provided through a supplied 3-wire power cable with one end terminated in an electrical plug as required by the customer’s facility. For power specifications, see *PSV5000 Specifications* on page 18. For cable location see [Figure 35](#).

## (Optional) Connecting an Ethernet Cable

---

A Network connection is on the Power Panel. Plug in an Ethernet cable. Refer to [Figure 2-1](#).

Network settings are described in [\(Optional\) Network Settings on page 38](#)



*CAUTION: Possible PC virus hazard! The PSV5000 System has no antivirus software installed from the factory. Prior to connecting to a network, Data I/O recommends installing antivirus software.*

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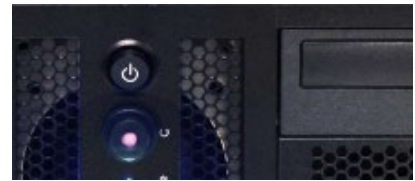
To install antivirus software refer to [\(Optional\) Installing Antivirus Software on page 38](#).



# Applying Power for the First Time

Before the PSV5000 System is turned on for the first time, ensure the following:

- The external air line is connected, and the main air valve is open.
- All E-Stop buttons are in the released (operating) positions (refer to [Emergency Stop \(E-Stop\) Buttons](#) on page 1-4 for location).
- All safety doors and access doors are closed.
- The programmer power toggle switch on the Power Panel is **ON** (UP) position.
- The power switch on the Handler Computer is set to the **ON** position (although it will not have power yet). The rocker switch is ON when tipped to the down position.
- (Optional) The Socket Adapters required for the job have been installed on all necessary programmer sites. See [Installing Socket Adapters](#) in the [Operator's Manual](#) for more information. Note that Socket Adapters can also be installed after power is on.



- 
- **Note:** To tighten socket adapters/boards, the recommended torque range for FlashCORE programmer screws is 1.4 – 1.5 Newton Metre (Nm)/ 12.4 – 13.3 pound force inch (lbf-in).
- 

When satisfied, rotate the main power switch on the Power Panel to the **ON** position (clockwise).

After power is applied, verify that no obvious failures or electrical anomalies occur. Verify that the Handler Computer starts properly and displays a network log-on dialog.

---

**Note:** If electrical or mechanical problems are noted, turn OFF the PSV5000 System and notify Data I/O Customer Support.

---

At the Microsoft Log-on window, click the user profile (usually labeled **MFG**) to complete the startup procedure.

## Shutting Down the PSV5000 System

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1. Finish and Exit any job that is running.
2. (Optional) Remove all devices from the system.
3. Exit CH700 and TaskLink and any other software that you have running.
4. Shut down the Handler Computer PC with the Windows Start menu.
5. (Optional) Save and exit the Laser Marker software.
6. (Laser Option) Turn OFF (0) the key-switch (counterclockwise) on the laser PC.
7. WAIT UNTIL WINDOWS COMPLETES SHUTTING DOWN, then rotate the main power switch (on the Power Panel) counterclockwise to the OFF (vertical) position.

If the PSV5000 Machine will not be used for several days, the shop air should also be removed or turned off at the Power Panel. (Optional) Padlock the main air pressure valve so that it cannot be turned back ON while the lock is in place

## (Optional) Installing Antivirus Software

---

The PSV5000 System has no antivirus software installed from the factory. It is highly recommend that customers install their own antivirus software. The software should be set to run virus scans manually rather than at a scheduled time unless you are sure that the PSV5000 System will not be running jobs at that time.

---

**Note:** An antivirus program may affect performance.

---

The PSV5000 System runs Windows 7 Professional 32-bit operating system. Follow instructions for your antivirus software. Contact Data I/O Service with specific questions. See [Contacting Data I/O](#) on page - 6 - (in Preface).

## (Optional) Network Settings

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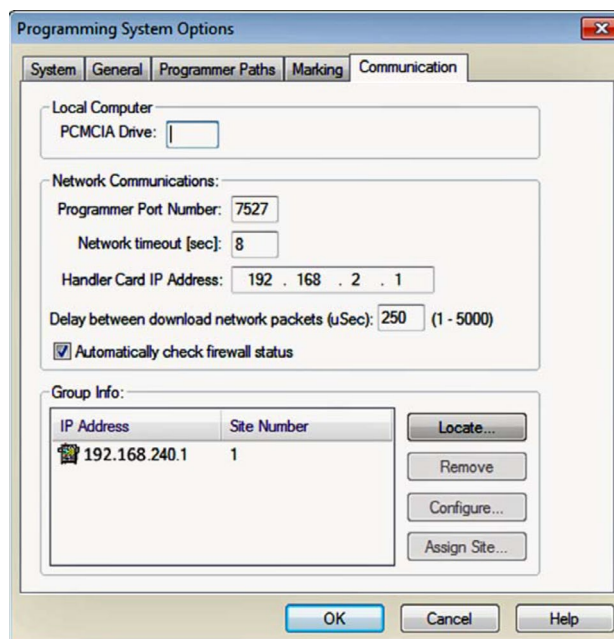
After starting up the PSV5000 System and logging on, double-click Computer > Map Network Drive (Windows 7).

### IP ADDRESS AND PORT NUMBER

If you need the IP Address for communicating with other Data I/O software, they are available via TaskLink. The Port numbers are also displayed. (Port numbers are the same for all programmers on a PSV5000 Machine.)

Addresses and Port numbers can be found as follows.

1. Start TaskLink on the target PSV5000 System. (Closing CH700 will return to TaskLink.)
2. Click System > Options > Communication tab. The IP Address and site numbers are listed in the lower left corner.



**Figure 17: TaskLink Communication Tab displays IP Addresses and site numbers.**

# Setting Up Input and Output Media



Note that the work surface layout is affected by what programmer models are installed.

There are many options for device input and output. One option for input and one for output must be set up on the PSV5000 Machine for your target job. Further, the setup must correspond with the current software, such as the Job file, winAH400.ini file.

These input/output media are described in this section:

- Static Tray (below)
- Reject bin
- Auxiliary tray
- Automatic Tray Feeder, page 43
- Tape Output Module, page 47

---

**Note:** *The Tape Input feeder installation is covered in the PSV5000 Operator's Manual.*

---

## About Static Tray Input and Output

The standard configuration for the PSV5000 System is static tray input and static tray output media. The latest tray mounting configuration uses two rows of locating pins and a magnet. Specific steps for installing trays are described in the PSV5000 [Operator's Manual](#).

---

**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). Pin 1 on Data I/O sockets is almost always toward the far side of the Socket Adapter (the back of the machine).*

---

Remember that tray arrangement affects:

- The Setup window > Options tab which must be set to match the workspace setup (covered in the [Operator's Manual](#)).
- The Package File which must be taught the Tray locations (covered later in Chapter 3 of this manual).

### REMOVING TRAY PLATFORMS

Static Tray Platforms can be removed to support different mediums such as to install an automatic tray feeder.

## REQUIREMENTS

Metric hex key set.

To remove a Static Tray Platform:

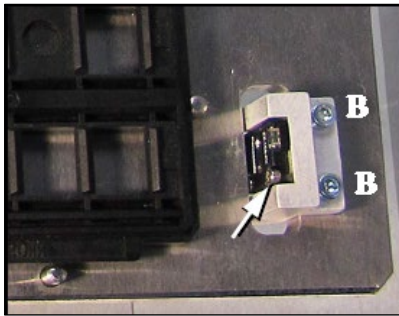
1. Shut OFF the PSV5000 System. See Shutting Down the PSV5000 System on page 38.
2. Disconnect the tray sensor-
  - 2a. Remove two sensor bracket screws (2.5 mm).
  - 2b. Lift the bracket up and remove the two screws securing the sensor to the bracket (1.5 mm).

---

**Note:** Best practice is to re-attach the sensor screws to the bracket, and the bracket to the platform so parts don't get lost.

---

3. Open the front or back lower access door and remove four screws from the target Static Tray Platform (3 mm hex key).



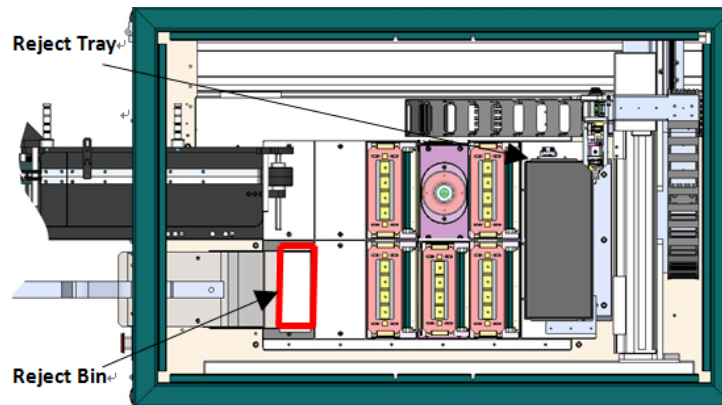
**Figure 18: Static Tray Sensor and bracket. Two bracket screws shown (at B). Only one of the sensor screws is visible (arrow). (This image is for reference only. Yours may not be positioned like this.)**

4. Move the sensor into the bottom side of the machine through the sensor cable hole in the working plate. Tie it carefully to the cable way.

To re-install the platform, reverse the steps for removal.

## Install the Reject Bin

Install a reject container for devices failing any process. Many workspace layouts are possible. Generally, a reject bin (or box) is placed on the front left of the workspace as shown in [Figure 2-5](#), on top the Tape Input media exit chute. However, a box or pad can be placed wherever there is room for it as long as its location is taught in the Package File.



**Figure 19: Common locations for the reject tray and bin with Tape Input and Tape Output. Only one is necessary. The reject bin that comes with the PSV5000 should be placed as shown.**

---

**Note:** On the Gantry window, the reject bin or tray is associated with a yellow position label that reads **RTr**.

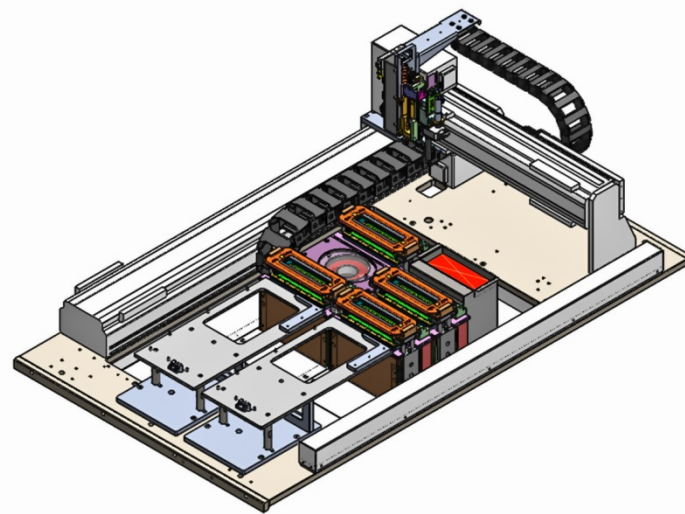
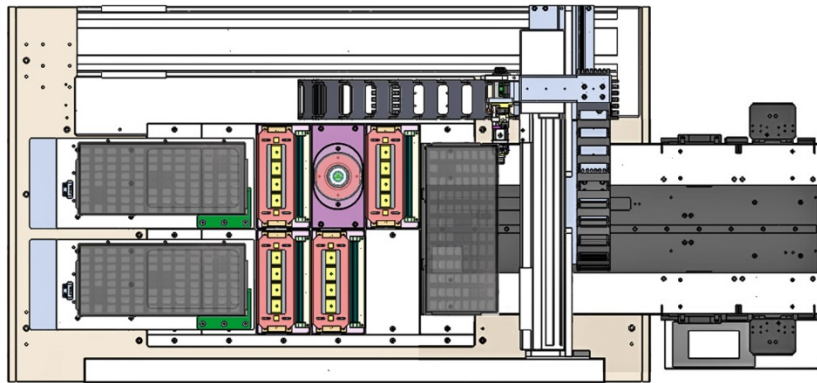
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The reject bin just lifts in and out by hand.

A tray may be used as a reject container instead of a bin.

## Auxiliary Tray

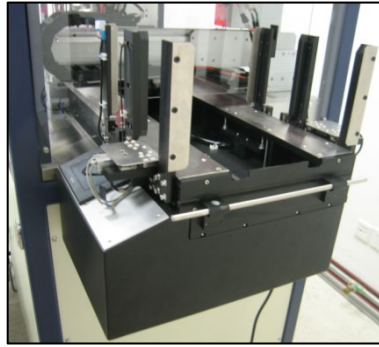
If a reject tray and an auxiliary tray is used as shown below, the mounting plate for the Tape-In Module must be removed as well as the mounting bracket for the reject bin. Contact Data I/O Support for instructions.



**Figure 20:** Two possible workspace configurations with trays on the left. A reject tray and an auxiliary tray with Auto Tray Feeder (top) and a Tray to Tray with a reject bin (trays not shown) (bottom). Two tray mounts must be installed on the left for these configurations.

## Setting Up an Automatic Tray Feeder

The PSV5000 System can be configured with an Automatic Tray Feeder. The Tray Feeder must be level to the Gantry and square to the PSV5000 Machine. For general information about setting it up, see the Tray Feeder Owner's Manual that came with your system. Look for the heading *Installation*.



**Figure 21: Tray Feeder mounted on PSV5000.**

The winAH400.ini file requires editing prior to using a Tray Feeder if your PSV5000 Machine has not already been set up for one at the factory. See the CH700 on-screen Help file for topic *Editing the winAH400.ini file*.



Prior to editing the winAH400.ini file, make a backup copy.

---

**Note:** When your winAH400.ini file is set to run an Automatic Tray Feeder, before you can run static trays again, the file will need to be changed back to `ModelTray1=STD`.

---

### INSTALLING THE TRAY FEEDER

The Tray Feeder can only be installed if your PSV5000 was set up for it at the factory or by a Data I/O Service Technician.

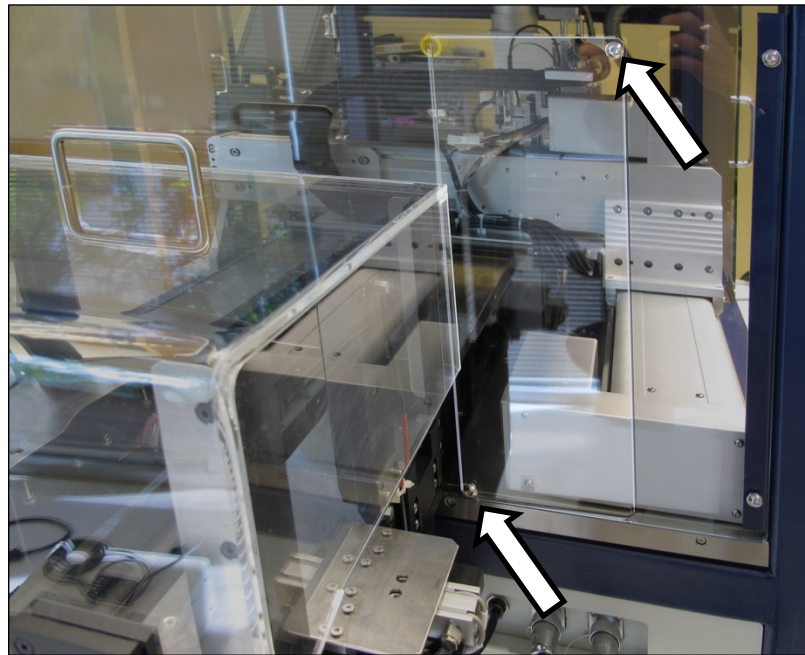
#### REQUIREMENTS

- Two people to lift it
- Metric hex key set
- Key to access door

To install the Tray Feeder:

1. Shut OFF PSV5000 power. See *Shutting Down the PSV5000 System* on page 38.
2. Remove the Input and Output static tray mounts, if installed. Refer to *Removing Tray Platforms* on page 40.
3. On the right side of the machine, locate the clear rectangular shield covering the Tray Feeder opening and remove the left screw with a 4 mm hex key.





**Figure 22:** The safety shield for the Tray Feeder has been rotated out of the way and fastened in the ‘storage’ position with the two screws (arrows).

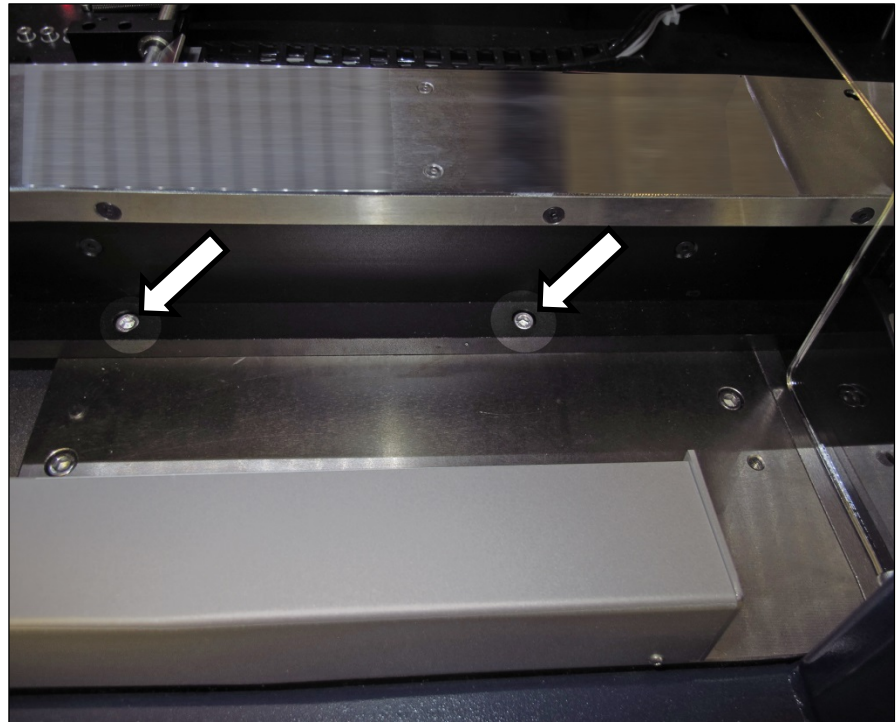
4. Loosen the lower right screw.
5. Rotate the shield up 90° clockwise and fasten in place at the extra hole with the screw removed earlier.
6. Get the Tray Feeder fasteners ready, and a 5 mm hex key.



*CAUTION: Heavy equipment! The Tray Feeder weighs 30 kg (66 lb.). Two people are required to lift it. A third person is needed to attach fasteners. Use caution.*

---

7. With two people lifting the Tray Feeder, slide the nose into the shield opening and far enough in to accommodate the mounting holes on the machine base plate.



**Figure 23: The Tray Feeder mounting screws (arrows). There are also two fasteners on the back side of the feeder (not shown).**



Refer to the following figure for Tray Feeder connections.

8. Screw in a screw into each of the four mounting holes to secure the feeder (5 mm hex key).
9. Plug in the three utilities: air, electrical, signal cable.  
The air connection has One-Touch fittings.  
The electrical connector can be rotated until it slides into the socket, and then screw the knurled ring up.



**Figure 24: Connection for the Tray Feeder: air, electrical and signal (left to right).**

Very basic operating instructions are covered in the PSV5000 Operators Manual. Complete instructions are covered in the Tray Feeder Manual.

### TRAY ARRANGEMENTS

You can use a spare tray with an Automatic Tray Feeder (ATF). When a spare static tray is designated, the devices from that spare tray are used to replace rejected devices. They are also used during a tray change.

Either a reject tray or bin is also required.

Remember that:

- the Setup window > Options tab must be set to match the workspace setup (covered in the Operator’s Manual).
- The Package File must be taught the location of the reject container (covered in Chapter 3 of this manual).
- (Optional) If the Sort-On-Error-Code is used, two Reject Bins are required. Set up for Sort-On-Error-Code by installing a second reject bin.



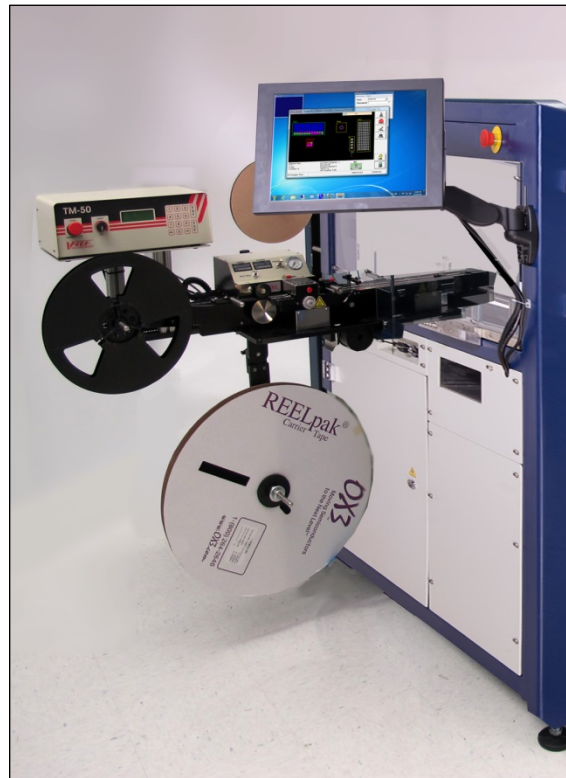
For more about Sort-On-Error-Code, see *Monitoring Statistics* on page 71.

## The Tape Output Setup and Operation

The PSV5000 System can be configured with an optional Tape Output System.

The Tape Output System receives programmed devices directly from the PSV5000 System via the PNP head. The Tape Output System advances

the carrier tape through a mechanism that seals the tape (using heat or pressure), and rolls the filled tape onto a reel for delivery to the next stage in the manufacturing process.



**Figure 25: Tape Output Module on PSV5000**

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*Note: For additional information, refer to the TM-50 Tape Output System User's Guide that came with your Tape Output System.*

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## INSTALLING THE TAPE OUTPUT MODULE

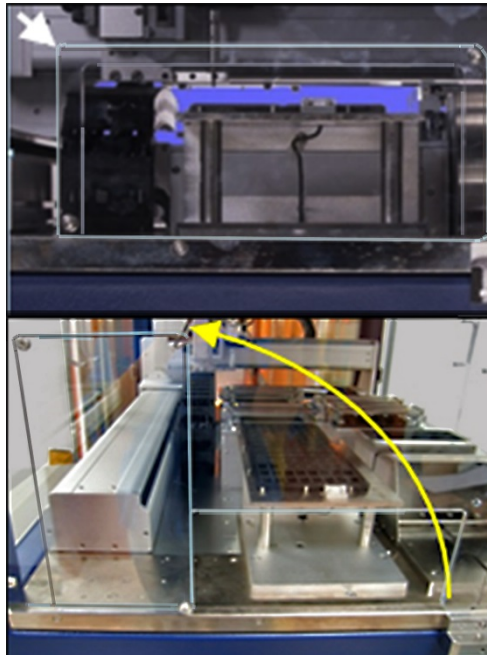
### TOOLS REQUIRED

- Metric hex key set
- Three people to lift / install the Tape Output Module

These steps are for installing the Tape Output Module (which can be ordered with the PSV5000).

1. On the left side of the machine prepare the small clear safety covers for receiving the Tape Output Module.
  - a. Loosen the screw on the lower left of a rectangular safety shield shown in Figure 2 - 14 (4 mm hex key).
  - b. Unscrew the top screw (4 mm hex key).

- c. Rotate the rectangular shield counterclockwise 90° to the 'storage' position and screw it to the fixed safety shield with the screw you just removed. Refer to the figure below.



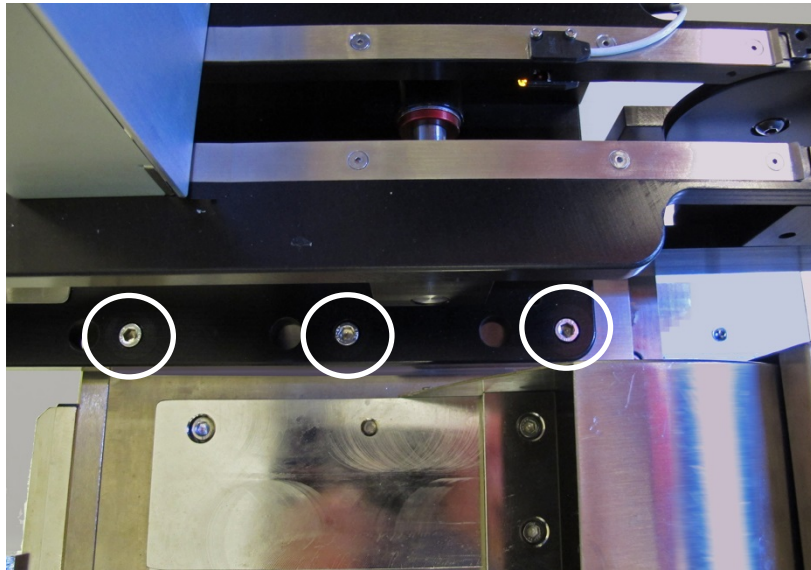
**Figure 26: To install the Tape Output Module, Shield rotates counterclockwise 90°.**

2. Unscrew the five screws that secure large fixed safety shield (4 mm hex key).



**WARNING:** Possible injury or property damage! The Tape Output Module is heavy. Use caution. Two people are required to lift this equipment. Approximate weight: 47.63 kg (105 lbs.). A third person may be required to bolt it into place.

3. Install the Tape Output Module onto the plate in the PSV5000 workspace and screw it down with six screws (5 mm hex key). See the figure below.



**Figure 27: Tape-Output Module mounting screws (circled). Three more mounting locations are on back side (hidden in this view). Ref: The Tape-In mount and chute are in the foreground.**

## SETTING UP THE TAPE OUTPUT MODULE

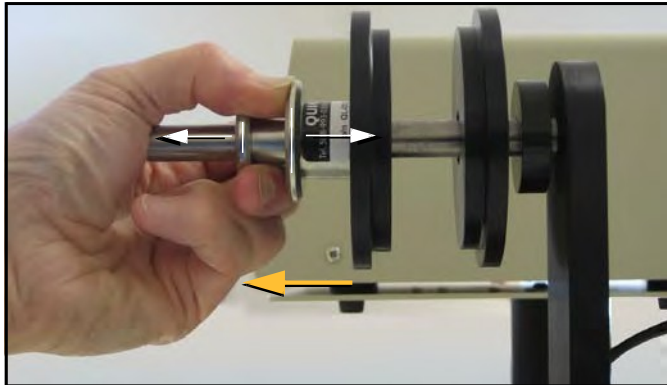


**CAUTION:** Possible tape damage from excessive heat! Improper routing of the device tape may cause enough heat to melt the tape. Ensure the correct routing path is followed. See the *TM-50 Tape Output System User's Guide*.

To set up the Tape Output System:

1. Edit the winAH400.ini file for Tape Output—
  - 1a. Using Windows Explorer, locate C:\CH700\winAH400.ini and make a backup copy, for example, winAH400backup.ini.
  - 1b. Open the original file with Microsoft Notepad.
  - 1c. Locate the line: TapeOutPutInstalled=FALSE and change it to True: TapeOutputInstalled=TRUE
  - 1d. Save the winAH400.ini file and exit Windows Explorer.
2. The Tape Output Module gets power and air from the PSV5000 System. Connect the compressed air, electrical power, and communication (Just right below the Tape Output System).
3. Ensure the PSV5000 System air is connected and power is ON.
4. Switch the Tape Output Module ON by pressing the power switch.

5. Set the taping job parameters at the controller. For more information see the TM-50 Tape Output System User's Guide.
6. Pull the nearest half of the track (table) out to the desired track width. It stops at detents set to specific tape widths.
7. Mount the carrier tape reel—
  - 7a. Remove the carrier tape quick lock from the carrier tape spindle.



**Figure 28: Removing the spindle.**

- 7b. Mount the bulk carrier tape reel on the right spindle so the tape unwinds from the top.
  - 7c. Replace the quick lock.
  - 7d. Trim the end of the carrier tape so it is clean and straight.
8. Route the carrier tape—
  - 8a. Guide the carrier tape into the loading track. It should feed right to left through the loading track easily.

---

**Note:** Lowering the feed reel support arm can reduce drag if the angle at which the carrier enters the loading track is too steep.

---

- 8b. Bring the end of the carrier tape past the sealer and engage the sprocket holes on the teeth of the drive sprocket.
9. Mount the cover tape—
  - 9a. Place a reel of cover tape of the correct width to match the carrier tape on the cover tape spindle. The tape should unwind to the right from the bottom of the reel.
  - 9b. Set the width of the cover tape guide assembly for your size tape.

- 9c. Use the Cover Tape Position Adjuster if needed. Turning it clockwise moves the cover tape position toward the sprocket side of the tape.
- 9d. Using blue tabbing tape, attach the cover tape to the carrier tape. Thread both through the cover tape Guide Sealer Assembly. Run the machine to advance the carrier and cover tapes through the sealer.

**PREPARE THE SEAL**

Heat Seal only

**Note:** Disable the pressure seal by loosening the seal roller pressure screws until the seal rollers are no longer in contact with the cover tape.

Normally the heat switch is in on position. If not, turn on the heat switch.

To prepare the heat seal

1. Set the temperature controls to the appropriate temperature. See the table below.

Carrier Tape Type	Cover Tape Type	Temperature	Air Pressure	Dwell Time
3m Type 3000 Conductive Carrier	3m Type 2675 Static Dissipative Cover	135-155°C	40-60 PSI	250-400 ms
3m Type 2701/2703 Non-conductive				
Advantek Conductive	Advantek Type AA			
Advantek Non-conductive	Advantek Type S			

**Figure 29:** This table lists suggested temperature and pressure settings for the Tape Output. The temperature of each shoe can be increased or decreased according the results of a peel force test.

2. Adjust the heat shoe air pressure to the appropriate setting. This setting controls the amount of force applied when the sealer shoes drop.



---

**Note:** *The recommended starting point for heat shoe air pressure is 50 PSI. Turning the heat shoe adjuster clockwise increases the pressure.*

---

3. After the heat sealer reaches operating temperature, set the controller parameters, if not already set.
4. Press Start in the LCD.
5. Advance the tape using the Manual Trig button in the LCD.
6. Check the sealed tape for the desired sealed position.
7. If necessary, adjust the inner seal position by turning the inner seal adjuster (thumb wheel) clockwise (to move the seal away from the operator) or counterclockwise. Tighten the position lock to secure it.
8. If necessary, adjust the outer seal position by turning the outer seal adjuster (thumb wheel) clockwise to move the seal toward the operator or counterclockwise (to move the seal away from the operator). Lock the adjuster into place using the position lock knob.

Pressure Seal  
only

#### For Pressure Seal (PSA)

1. To prepare the pressure seal. Set the temperature to Room Temperature, 25°C .
2. Advance the tape using Manual Trig button in the LCD.
3. Adjust the inner and outer seal roller position. Align the roller position over the strip of adhesive on either side of the PSA cover tape. Both thumb screws have locking devices.
4. Adjust the pressure at both sealer wheels to free spinning and then 1/8 revolution tighter. Use a 2 mm hex key.
5. Advance the tape using the Manual Trig button in the LCD. Re-adjust the seal roller pressure until the PSA adhesive is firmly adhered to the carrier tape.

---

**Note:** *Excessive roller pressure may cause carrier tape advance problems or elongation of sprocket holes in the carrier tape.*

---

#### CHECKS TO PERFORM PRIOR TO RUNNING

6. Mount an empty take-up reel on the spindle.
7. Perform a Peel Force Test Perform as many peel force tests as needed while adjusting the sealer controls to obtain the required seal strength.



Remember: when the reel is being taped on the TM-50, the trailer will be the first length of empty carrier tape run before the first device is taped, and the leader will be the length of empty carrier tape run after the last device is

8. Create the Trailer and Leader Before beginning a production reel, determine how long the trailer and the leader should be. Run out enough sealed empty pockets to make the trailer that is required for the current job.
9. Check Carrier Tape Alignment To ensure an accurate count, select a spot on the loading track as a reference point for the first and last devices counted.
10. Set the Counter Set the counter STOP value in the LCD to a big number as 9,999.

---

**Note:** Use the counter on the Tape output system if desired. However, we recommend setting this counter to zero and using the pass quantity on the PSV5000 System to monitor quantity.

**Note:** When starting a job that uses Tape Output, pull the red “E-Stop/On” button on the taping machine to start it.

---

### PLACING DEVICES

Devices are placed by the PNP head when your job is run.

### ENDING A TAPED RUN

See the PSV5000 [Operators Manual](#) or the TM-50 Tape Output System User’s Guide.

### REPLACING A FULL TAKE UP REEL

See the PSV5000 [Operators Manual](#) or the TM-50 Tape Output System User’s Guide.

### REMOVING A TAPE OUTPUT MODULE

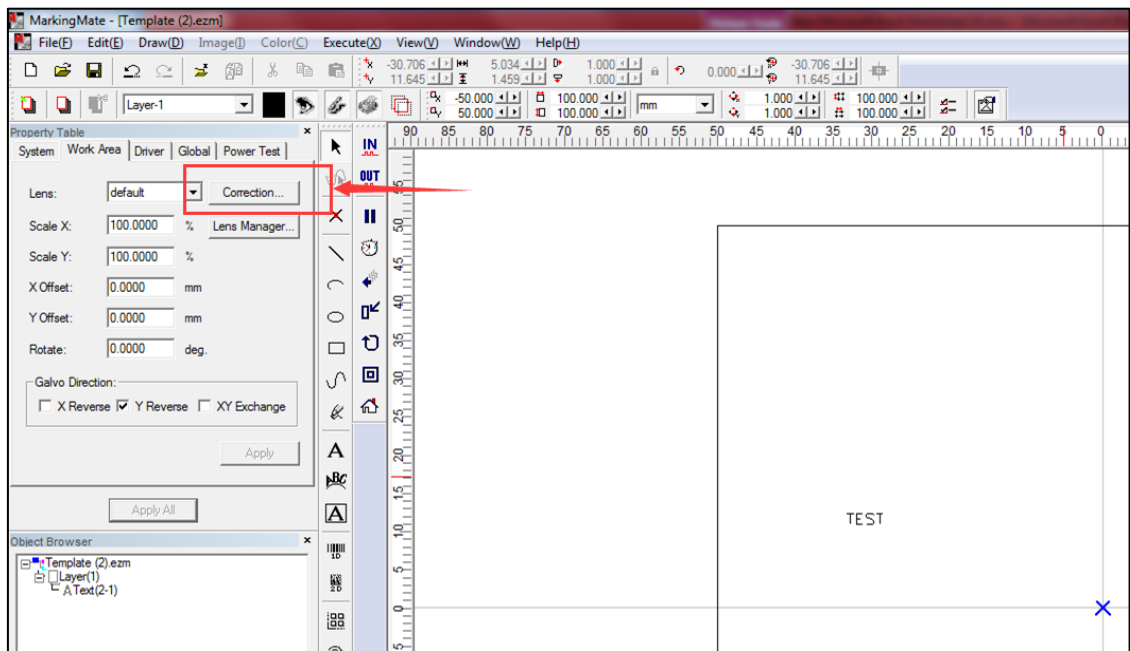
Removal of the Tape Output Module is in the reverse order of installation. See the instructions above.

# Setting Up the Laser Marking Module

## Preparation:

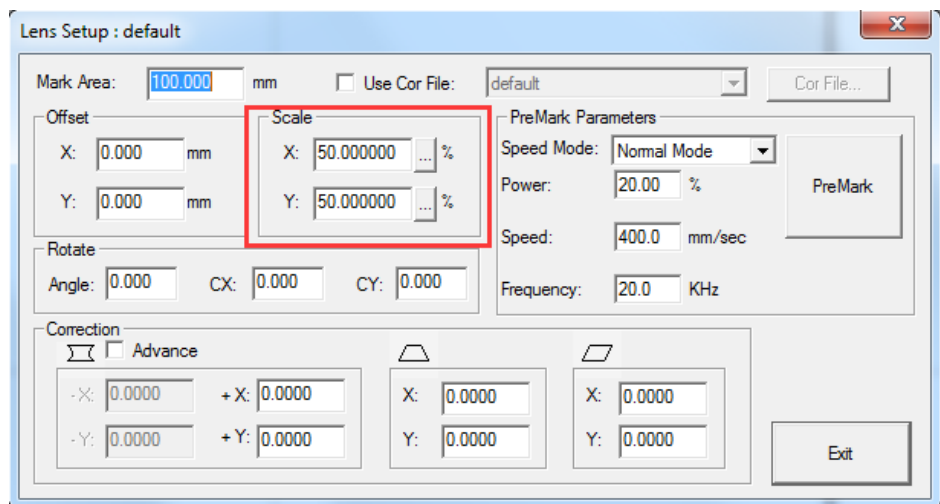
---

1. Make sure a USB dongle for the laser has been updated.
2. Upgrade CH700 to V2.3 by installer.
3. Copy CH700.exe (v2.3.2) from [\\sol\ProjDocs\PSV5000 - 1071\Software\CH700 v2.3.2](\\sol\ProjDocs\PSV5000-1071\Software\CH700 v2.3.2) to <C:\CH700> to replace exe of v2.3.
4. Update below values in the package file
  - 5.#134 1500 MSEC, LASER SHUTTLE MOVING TIME
  - 6.#137 0 NUM, INCREASE OR DECREASE LASER POWER OF CUP2 BASED ON CUP1
  - 7.#138 0 NUM, DISTANCE BETWEEN CUP1 AND CUP2 IN X DIRECTION
  8. #139 -42000 NUM, DISTANCE BETWEEN CUP1 AND CUP2 IN Y DIRECTION
5. Start 'MarkingMate.exe.'
6. Click a blank space on work area, and then at the Property Table, click Work Area tab, and click Lens Correction to open the Lens Setup dialog.



**Figure 30:** The Lens Correction button in the MarkingMate software.

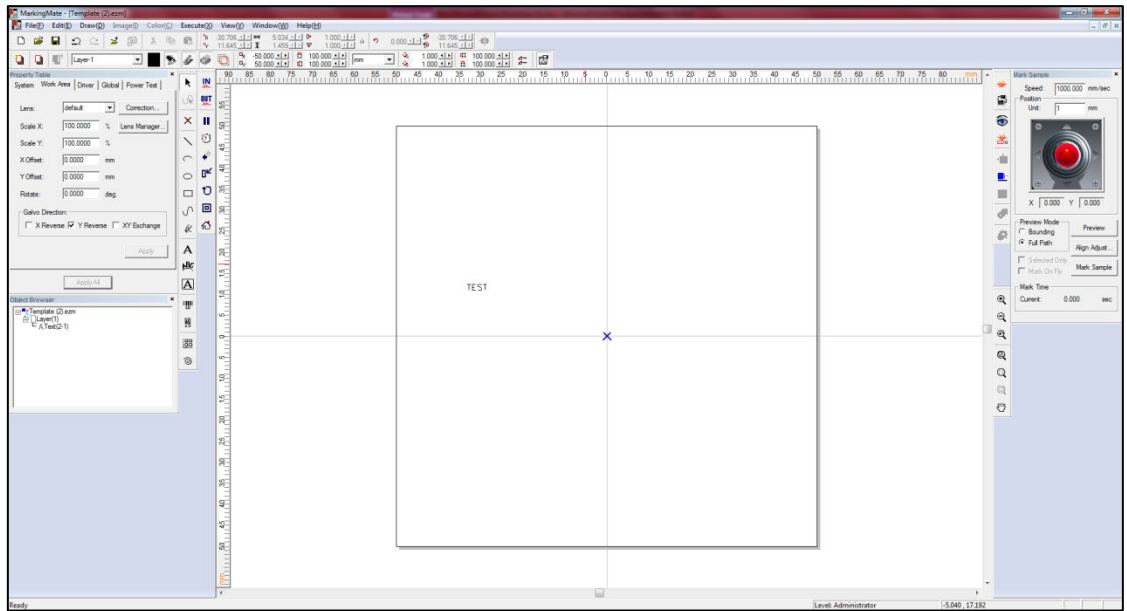
7. Confirm scale settings are the same as shown in Figure 32: below. They are system values: confirm or calibrate initially and each time there is a hardware change.



**Figure 31:** The Scale factors in the Lens Setup dialog.

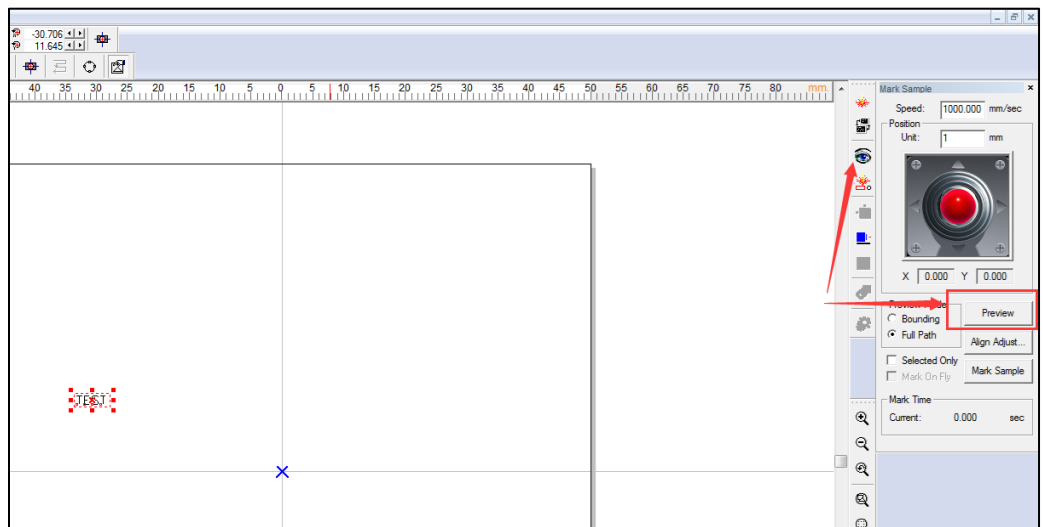
## Laser Software Instruction

1. Copy Template.ezm and rename it for your job, or start the MarkingMate.exe to create a new blank file and then add a text string into the work area for marking.



**Figure 32: Adding text to mark the devices.**

2. Enter preview mode (see image below) to confirm the real world marking position is set to **Cup1** of shuttle. Move the red light to cup1 position using the arrow key if they do not match.



**Figure 33: The Preview button.**

3. Save the file and exit the software.

## CH700 Configuration

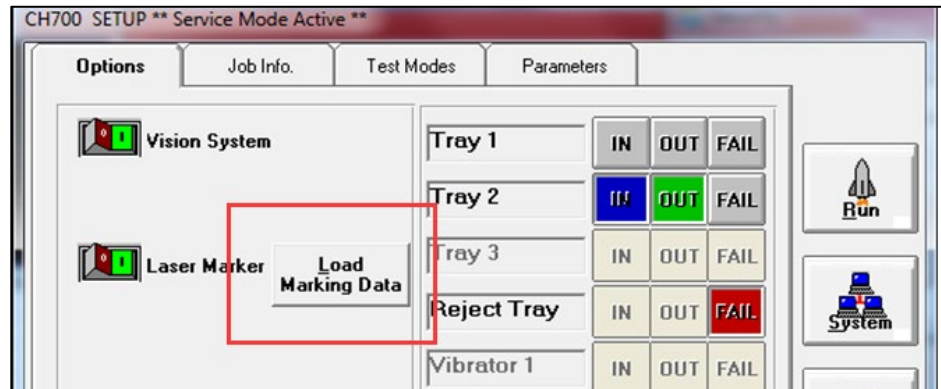
1. Make a backup of the winAH400.ini file.
2. In the winAH400.ini file make the following changes:
  - a) Set MarkerSystem=UPRHAND to enable the laser.

- b) Set LaserRemoteConnection=LOCAL to choose a laser control method.

```

;LaserRemoteConnection=SERIAL 7
LaserRemoteConnection=LOCAL
    
```

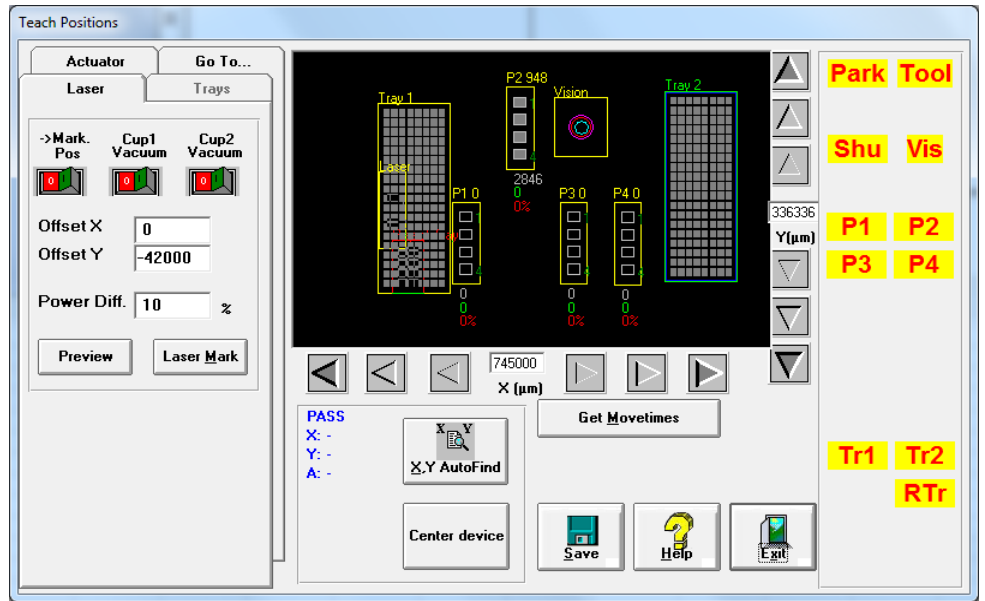
*Note: Load Marking Data can show 'MarkingMate' Software for marking content edits.*



**Figure 34: The Load Marking Data button in the CH700 Setup window opens the MarkingMate Software.**

*Note: Cup1 position must be set correctly by MarkingMate.*

3. Click System > Gantry > Laser tab.
  - a. Switch on Cup1 Vac then click Preview to confirm red light aims at cup1. If not please run Markingmate to move the red light to match cup1.
  - b. Switch on Cup2 Vac and click Preview and set red light for cup2. Change Offset X / Offset Y to set distance between cup1 and cup2 in X/Y directions.
  - c. The Power Diff. field is the laser energy difference between cup1 and cup2; for example, if power of cup1 is set to 20%, here set to 10% means power is 30% for cup2.
  - d. After setting the proper positions, click Laser Mark to check real marking results.



**Figure 35: The Laser tab in the Gantry window. See instructions in step 3 above for descriptions of controls on the Laser tab.**



## 3 — Chapter Three

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# Administrative Functions

The two primary levels of operation of PSV5000 are • Operator functions, and • Administrator functions.

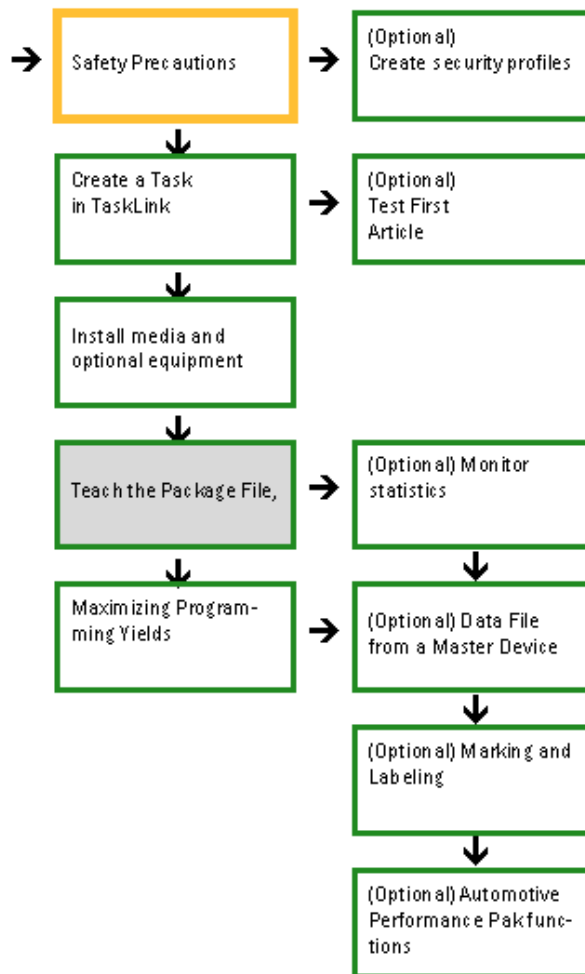
Only Administrator functions are covered in this manual.

Operator functions are covered in the separate [PSV5000 Operators Manual](#), although Administrators should be familiar with all operator functions.

**Administrators** generally follow the sequence on the next page to *create* a job:



Creating a Job—Administrator Functions at a Glance



**Figure 36: Detailed Administrator Functions begin on the next page. Shaded boxes are activities that are performed once per package type.**

## Safety Message and Precautions

For your safety and preventing loss of time and damage to equipment, this manual uses special symbols, paragraphs, and color to call your attention to hazardous situations and recommend safe practices to help avoid them.

Refer to *Using This Manual* on page - 1 - (in the Preface) for symbols and fonts used for safety messages.

Refer to *Safety Systems on page 12* for safety regarding Emergency Stops, the safety doors, and ESD.

# Administrator Functions

Administrators are responsible for creating Tasks in TaskLink™ and Job Creator, and for other functions **not** generally performed by operators. Administrators would likely perform these functions:

- *Editing the winAH400.ini File on page 64*
- *Creating a Task in TaskLink on page 64*
- *Creating Security Profiles on page 65*
- *(Optional) Do a First Article Test on page 66*
- *(Optional) Setting TaskLink to Operator Mode on page 68*
- *Enhanced Yield Programming on page 68*
- *Teaching the Workspace Locations on page 69*
- *Optimize Movetimes on page 70*
- *Monitoring Statistics on page 71*
- *Maximizing Programming Yields on page 77*
- *(Optional) Creating a Data File from a Master Device on page 80*
- *Creating a Laser Marking File (if marking) on page 81*
- *Automotive Performance Pak on page 89*

These functions are discussed in this section.

## Reference List of *Operator* Functions

---

These functions for operators are **discussed in the separate Operators Manual**.

---

*NOTE: All users, administrators, and operators should know these procedures.*

---

Checking the System  
Installing Input/Output Media  
Installing Socket Adapters and Actuator Plates  
Installing the Correct Probe  
(Optional) Installing the Correct Shuttle Cups  
Turning PSV5000 System Power ON  
Selecting a Job (Starting CH700 via TaskLink or Job Runner)  
(Optional) Preselecting Programmers  
Setting Media and Options—the Setup window  
Starting Programming

—After Starting a Job...

Stopping the System

Light Tower Interpretation

(Optional) Changing Programmer Status

Turning PSV5000 System Power OFF

(Optional) Operating the *Tray Feeder*

## Editing the winAH400.ini File



More information about the winAH400.ini file is in the CH700 on-screen Help.

The winAH400.ini file can be edited to add or remove options which determine their availability in the CH700 Setup window. It also sets non-programming features such as language and which events cause warnings to display. This is a text file that can be edited in text editors such as Notepad or UltraEdit. Do not use Microsoft Word or other word processors since they may add hidden special characters such as end-of-page characters.



**CAUTION:** File corruption hazard! Before making any changes to your winAH400.ini file, save a backup copy.

The winAH400.ini is on the Handler computer in the C:\CH700\ folder.

## Creating a Task in TaskLink or Job Creator



Once a Task is selected and a Pass Limit is set, the Task is referred to as a job to run on the PSV5000 System. The same Task can be used for many FlashCORE jobs.

Note that operators can change the Pass Limit in the CH700 Setup > Job Info tab.

**TaskLink** stores *Tasks* (settings for programming job) for FlashCORE programmers in a Task database file (\*.TSK). A Task contains all the information necessary for programming and testing specific devices with a specific algorithm.

**Job Creator** stores *Jobs* for LumenX programmers in directory C:\LumenX\Jobs. A Task contains all the information necessary for programming and testing specific devices with a specific algorithm.

### SETTINGS AND FILES SELECTED FOR TASK/JOB

Tasks and Jobs include:

- Device settings - identifies a specific device (or family of devices to select from)
- Data file name and apropos settings
- System settings - Package file name

- Process settings - Continuity check, electronic ID check, blank check, erase, verify, program, and device marking/labelling information.
- (Optional) Setting the Pass Limit (the quantity of devices to program for this job) after clicking Run.

In addition to containing all device-specific settings, a Task/Job references these files:

File	Information
Package File (*.txt)	For instructions on creating a Package File, see <i>Teaching the Workspace Locations</i> on page 69.
Data File (*.hex or *.bin, for example)	The data file contains your data to be programmed into the devices.
Laser Marking File	See (Optional) <i>Creating a Laser Marking File</i> on page 81.

### TASK/JOB CREATION IS DETAILED IN THE SOFTWARE ONLINE HELP

For complete instructions on how to create a Task/Job:

- in TaskLink see TaskLink’s online Help Topics.
- In Job Creator see Job Creator’s online Help Topics.

Both applications will automatically start the CH700 Application Software when Run is clicked.

### (OPTIONAL) PRESELECTING PROGRAMMERS

When CH700 starts, programmers that are not used for a particular job can be turned off to improve efficiency; see the PSV5000 Operators Manual for more. Note that operators also have access to this feature.

It is NOT necessary to restart programmers between jobs.

## Creating Security Profiles

With the Security Dialog in CH700, administrators can create and manage user profiles to control security by allowing different rights to different profiles.

To create a new profile:



Definition: A Task becomes a ‘Job’ once a Task is set to Run and a Pass Limit is requested and set. A Task can be used for many FlashCORE Jobs.

Job Creator for LumenX programmers uses only the term *Jobs* (does not refer to *Tasks*).



Use the physical keyboard instead of the on-screen keyboard when entering passwords.

1. At the Main CH700 (start) window, clicking **Start** will open the Security Dialog in the background. It may be obscured by other dialogs.
2. In the Security Dialog, use the drop-down arrow to select **Supervisor**.
3. Enter the password.
4. Click **Edit Users**.
5. Type a name into the **Name** field.
6. Type a password into the **Password** field.
7. Check the box next to each stated right (privilege) for the new user. For example: if the new user is to create or edit Package Files for jobs, check **Teach Package**.
8. Click **Save** (the diskette image).

## (Optional) Do a First Article Test

Prior to programming hundreds of devices, a newly created TaskLink Task is tested. Follow your company's First Article Test Plan. The two methods discussed below are 1) Prior to creating a Package file, and 2) after creating it.

### TEST PRIOR TO CREATING A PACKAGE FILE

Outlined below is a suggested test process using Data I/O's desktop programmer called FlashPAK III. This method allows testing without first having to create the Package File required for PSV5000.

1. Create a new Job for FlashPAK—
  - 1a. In TaskLink, set the Programming System to FlashPAK (System > Select Programming System > FlashPAK).
  - 1b. Open Task Manager and create a new Task with the **Add** button.
  - 1c. Create the Task as usual in the Edit dialog.
2. Test the new Job on FlashPAK—
  - 2a. Using the **Load** button, send your new Task to a PC Card, or, if the FlashPAK is on a network, select it.
  - 2b. Test the Task on the FlashPAK by programming a device and verifying the results.
3. Duplicate the Job for your PSV5000 System—



For help with FlashPAK see its Operator's Guide.

- 3a. If the job passed the tests, in TaskLink Task Manager, select the Task and click Duplicate. Enter a name and click OK.
- 3b. Edit the Task so that it can be used on your PSV5000 System as follows:
  - I Select the Task,
  - II Click Edit,
  - III On the Task tab, use the Programming System Type drop-down arrow to select PSV5000,
  - IV On the Handler Files tab, select (or create) a Package File name,
  - V Click OK.
4. Run the duplicated Task on the PSV5000 System—

---

**Note:** If you have the option selected to Automatically Switch Programming Systems, (System > Options > Automatically Switch ...) then you can skip the next step.

---

- 4a. Close Task Manager and change the programming system to PSV5000 System (System > Select Programming System). Re-open the Task Manager.
- 4b. Select the duplicated job and click Run.

---

**Note:** The Package File must be taught if it is new.

---

### TEST AFTER CREATING A PACKAGE FILE

After a Package File is created (described in the next few headings) or it already exists for this package type and job, then this first article test method is best when your job includes Laser Marking.

1. Create the PSV5000 job—
  - 1a. In TaskLink, create a new job for PSV5000 Systems.
  - 1b. Click Run (or Load) in TaskLink to start the CH700.
2. Run one device—
  - 2a. In CH700, click Start.
  - 2b. In the Setup window, select media options as usual.
  - 2c. At the PSV5000 workspace set up the input and output media as usual.
  - 2d. Click Run > Run One.



Programmers that are not used for a particular job can be turned off in the CH700 Start window.

- 2e. After it finishes, verify that the job passed the tests.

---

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

---

## (Optional) Setting TaskLink to Operator Mode

Options to add, remove, and edit Tasks are found in TaskLink's Task Manager Dialog when in Administrator Mode (the default). You can set TaskLink to Operator Mode which limits actions to running and viewing tasks in the Operator Dialog but not editing or deleting Tasks, Kits, or Archived Jobs.

To switch between Operator Mode and Administrator Mode, see TaskLink's online Help.

## Enhanced Yield Programming



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



For more information about Security see *Creating Security Profiles* on page 65.

1. Several selections on the Setup window > Options tab affect yield that are not set in TaskLink. Administrators may wish to advise operators regarding the setting of the Continuity Retries field and the Fail Retries field.
2. **[Automotive Performance Pak only]** Optional: Determine if any of the five utilities available with the AP Pak are required for this job. They must be set in the CH700 Setup window > Options tab.
3. Set security rights for each operator that you do—and do not—authorize to make AP Pak changes. Changes to User Rights are made in the Security Dialog.

---

**Note:** *Only installed options are available for selection on the Options tab. If different input media (tape or tray) is desired, the winAH400.ini file may need to be edited. See the online Help for instructions editing the WinAH400.int file or contact Data I/O support or an authorized technician.*

---

## Dry Run (Ignore Programmers)

(Optional) If you want to do a Dry Run or transfer devices from input media to output media with no programming, click **Ignore Programmers** so it is ON (green); the PNP head will not stop at the programmers. Laser



marking can be used with Ignore Programmers turned ON. The default is Off.

---

**Note:** Set security rights for each operator to use—or not use—the Ignore Programmers option. Changes to User Rights are made in the Security Dialog.

---

## Teaching the Workspace Locations

The Package File is a text file containing calibration information that the PNP head uses to properly pick, rotate and place devices.

After your new Package File is taught, it will contain information about the specific device package and Socket Adapter as well as the number of programmers, input and output media, and optional equipment such as laser marking, if applicable.

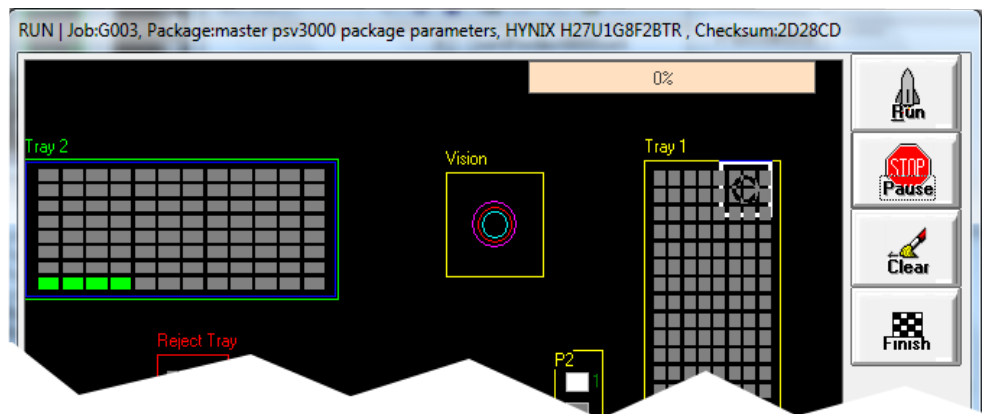
A Package File must be created for each device that uses a different Socket Adapter. If a Package File already exists that can be reused (same device package, same Socket Adapter, and same input/output media) a new one is not necessary.



Package Files reside in the Handler Computer in Folder  
C:\CH700\Package..

### PREREQUISITES

- A Task and a Package File must exist. For more information, see topics above.
- A primary device has been selected.



**Figure 37:** Run window shown with static Trays.

### TOTEACH LOCATIONS

1. Run the job in TaskLink/Job Creator/Job Runner that uses your new (renamed) Package File.
  - 1a. Select a Task/Job and click Run.

- 1b. When the CH700 Application opens, click **Start**.
  - 1c. At the Setup window, make setup selections.
  - 1d. Click **System > Gantry**. A password may be required—refer to [Creating Security Profiles on page 65](#).
2. To continue, see the CH700 on-screen Help (*Teaching Locations > Printable list of the steps*). It covers teaching workspace locations for all media options.

---

**Note:** The PSV5000 System can have static trays or a Tray Feeder. Teaching tray locations is the same for both.

---

### ERRORS

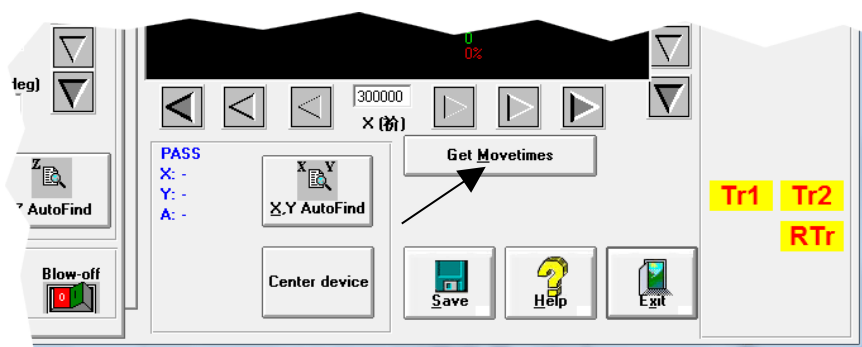
Please Refer to CH700 on-screen Help. In the Help table of contents click Browse Sequences->Create a Package File->Errors Creating the Package File.

## Optimize Movetimes

After the equipment locations are taught, you can optimize the movement of the PNP head in the work envelope. This command (Get Movetimes) calculates programming times versus head travel time to decide the best PNP head path, especially effective when some programmers are not used.

To get Movetimes:

1. On the Gantry window, click **Get Movetimes**.



**Figure 38:** Click **Get Movetimes** to optimize head travel.

2. Click **Yes** when prompted to save positions.



For turning ON Sort-On-Error-Code in the winAH400.ini file, see the CH700 on-screen Help.

For setting up Sort-On-Error-Code see TaskLink Help for PSV5000.

## Monitoring Statistics

Occasionally, the system administrator may require statistics for a group of devices for a given job. This is easily accomplished using any of three statistics tools described on the next pages:

- TaskLink's Session Data Logging feature
- the CH700 Statistics window
- (optional) Statistical Process Control Software (customer-supplied)
- Sort-on-Error-Code separates devices that fail specific, customer specified processes.

In addition, Data I/O offers additional utilities for enhancing yield and reducing errors. These include the Automotive Performance Pak (see page 89) and several other software packages and hardware such as Factory Integration Software (FIS) and Serial Number Server (SNS).

### TASKLINK SESSION DATA LOGGING

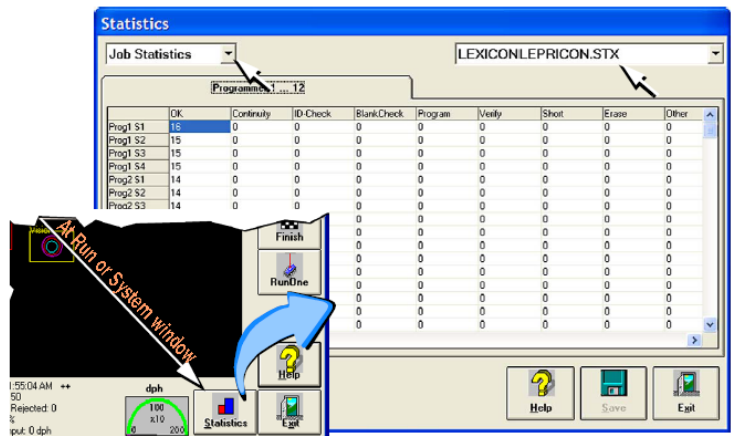
For complete instructions on enabling and using TaskLink's Session Data Logging option, see TaskLink online Help.

### CH700 STATISTICS WINDOW

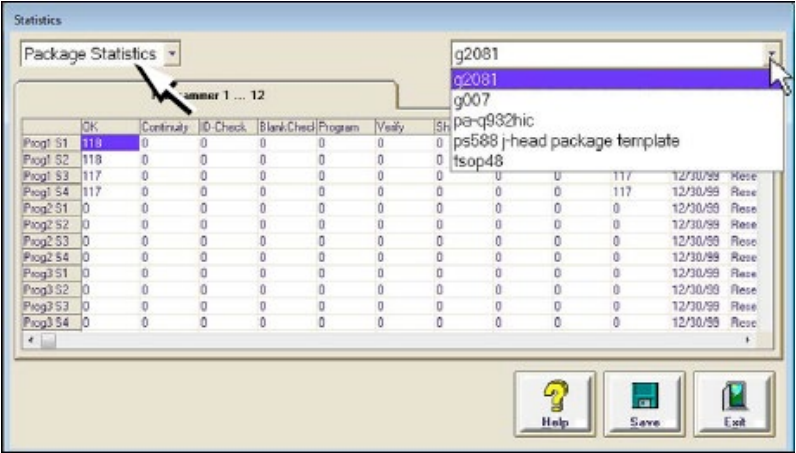
The PSV5000 software called CH700 provides statistics that include: devices programmed successfully, *continuity* failures, and *verify* failures.

To view programming statistics using the CH700 software:

1. At either the Setup window or at the Run window, click **Statistics**.
2. Select either Package Type or Job Statistics from the drop-down field in the upper left corner.



**Figure 39:** At the Statistics window, the Job Statistic file can be viewed (Jobname.stx) as shown. When Job Statistics is selected, Pass/Fail criteria are logged for each individual socket and programmer listed in the left column.



**Figure 40:** At the Package Statistics window, statistic can be viewed by Package Type (PackageType.sts).

**RESETTING PACKAGE STATISTICS**

The Package statistics displayed correspond to the Package File and therefore to the Socket Adapter used. When a Socket Adapter is replaced on a programmer, statistics for that Socket Adapter must be reset.

To reset Package statistics:

1. In the Statistics window, select Package Statistics in the drop-down field in the upper left corner. Refer to the image below.
1. Click Reset in the right-most column corresponding to the programmer on which the Socket Adapter was replaced.
  - For example, if a Socket Adapter was replaced, reset all rows for that programmer.



\*For FlashCORE, only HIC Socket Adapters and HPS Socket Adapters are designed to accommodate replacement of individual sockets on the adapter board. For LumenX, Socket Adapters only have one socket.

- If an individual socket was replaced\*, reset only the row corresponding to the replaced socket.

The **R-date** (reset date) is set to the current date and statistics are all reset to zero.

	OK	Continuity	ID Check	Blank Check/Program	Verify	Short	Erase	Other	Totals	R Date	Reset
Prog1 S1	203	2	0	0	0	0	0	0	206	12/00/99	Reset
Prog1 S2	46	0	0	0	0	0	0	0	51	12/00/99	Reset
Prog1 S3	42	0	0	0	0	0	1	0	45	12/00/99	Reset
Prog1 S4	41	0	0	0	0	0	0	0	44	12/00/99	Reset
Prog2 S1	553	0	0	1	0	0	0	0	554	12/00/99	Reset
Prog2 S2	19	0	0	0	0	0	0	0	20	12/00/99	Reset
Prog2 S3	19	0	0	0	0	0	0	0	20	12/00/99	Reset
Prog2 S4	19	0	0	0	0	0	0	0	20	12/00/99	Reset
Prog3 S1	417	0	0	0	0	0	0	0	418	12/00/99	Reset
Prog3 S2	4	0	0	0	0	0	0	0	5	12/00/99	Reset
Prog3 S3	4	0	0	0	0	0	0	0	5	12/00/99	Reset
Prog3 S4	4	0	0	0	0	0	0	0	5	12/00/99	Reset
Prog4 S1	20	0	0	0	0	0	0	0	21	12/00/99	Reset
Prog4 S2	4	0	0	0	0	0	0	0	5	12/00/99	Reset
Prog4 S3	4	0	0	0	0	0	0	0	5	12/00/99	Reset
Prog4 S4	4	0	0	0	0	0	0	0	5	12/00/99	Reset

**Figure 41: Resetting Package statistics. Open the Statistics window from either the Setup window or the Run window.**

### STATISTICAL PROCESS CONTROL SOFTWARE

The CH700 can be set to generate a semicolon-delimited file whose fields are described on the next page. A (customer-supplied) Statistical Control SW can be used to import and process data output by the CH700. Or use Data I/O's Enhanced Statistical Software that comes with the CH700; refer to page 89.



**CAUTION:** File corruption hazard! Before making any changes to your winAH400.ini file, save a backup copy.

To generate a semicolon-delimited output file:

1. On the Handler Computer, navigate to C:\CH700 and open winAH400.ini (with Microsoft® Notepad or IDM Computer Solutions's UltraEdit®).
2. Locate the section for SPC Logging. It will look like this:  

```
[SPC Logging]
LoggingEnabled=FALSE
MaxFileSize=10485760
TempLogFile=C:\spcout.txt
```
3. Set the second line (LoggingEnabled) to TRUE.
4. (Optional) Edit the location of the output file at the line "TempLogFile=..." entering the drive and path desired.
5. Save and close winAH400.ini.

---

**Note:** In the above example the SPC logging file is saved to C:\ directory. It can, however, be saved elsewhere on the Handler Computer hard drive, or on a networked drive if network connected.

---

The SPCOut.txt file contains semicolon-delimited fields. A partial list follows:

#### The SPCOut.txt Field Descriptions

---

- 01 DevicesInputsystem - number of devices picked from Input media
- 02 DevicesInspected - number of devices inspected by Vision system
- 03 InspectionQuality\* - as percentage, compared with reference vision
- 04 InspectionYield
- 05 DevicesInsertedSocket - number of devices inserted into socket
- 06 SocketYield
- 07 ProgrammerYield
- 08 ProgSysYield - Yield of all programmers together
- 09 DevicesProcessedMarker
- 10 MarkingYield
- 11 SystemThroughputExcWait - starts with first device placed, excludes wait times.
- 12 SystemTotalThroughputIncWait - starts when Run starts, includes wait times
- 13 SystemYield
- 14 AreaID - Programmer #1 = "17", Programmer #2 = "18", ..., Programmer #6 = "40")
- 15 PosID - that is Socket #
- 16 TimeStamp - Date/Time of SPC log entry
- 17 OrderNumber - Job Name and or number
- 18 Package - A *Package* File used for the job

If the Automotive Performance Pak is installed, an *extended* SPC log file (with APP enabled) would have the following delimited fields:

TimeStamp

JobName  
JobDescription  
Device  
Package  
VisionPRJ  
RecordID  
SystemStatus  
SystemMSG  
FromAreaID  
FromPosID  
DeviceStatus  
WhichCup  
SNused  
ToAreaID  
ToPosID  
DevicesInspected  
InspectionPassed  
InspectionQuality  
DevicesInserted-Socket  
SocketYield  
ProgrammerYield  
ProgSysYield  
DevicesProcessed-Marker  
DevicesMarked  
DevicesInputSystem  
SystemYield  
SystemThroughputExcWait  
SystemTotalThroughputIncWait  
DevicesOutputSystem  
MachineID  
ProgTime

\*Inspection quality contains a 4 number record divided by the pipe[|],  
such as 1|2|3|4.

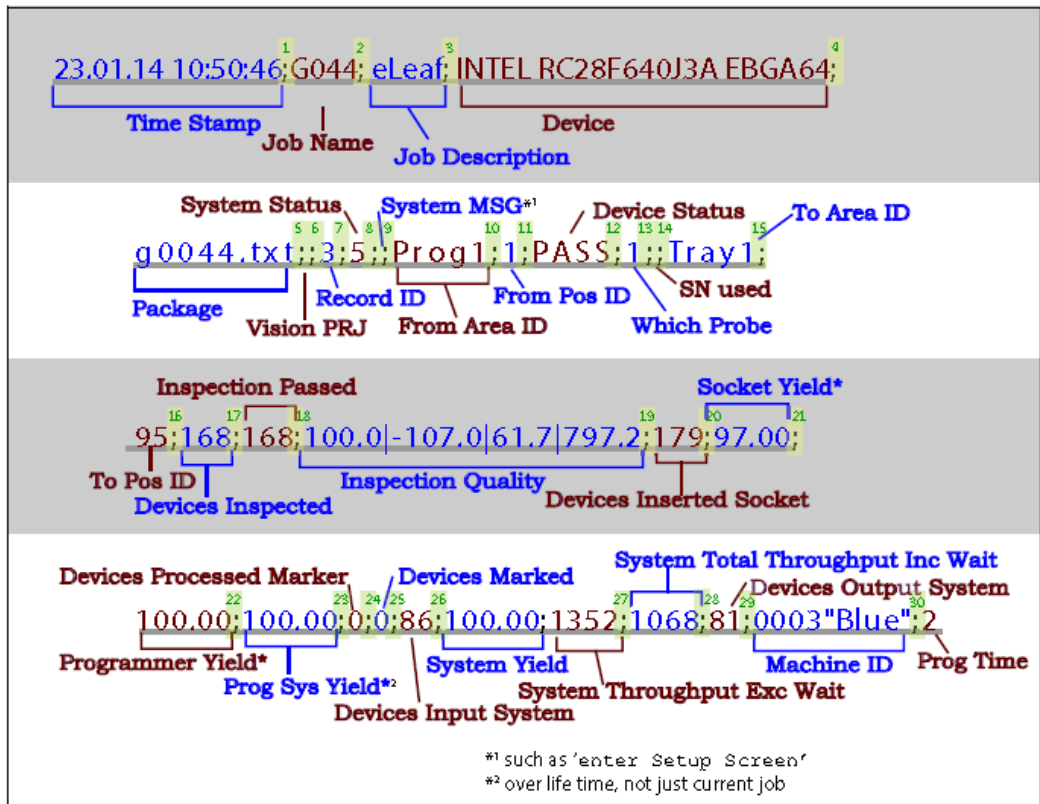
1: 100.0-> vision pass or XXX.X->vision error code

- 2: dX
- 3: dY
- 4: dZ

**EXAMPLE:**

100.0|85.0|-152.4|-1022.4

dX,dY are recorded in  $\mu\text{m}$ , dR is in microdegree ( $\mu\text{deg}$ )



**Figure 42: Sample SPC Log File line entry defined.**



# Maximizing Programming Yields

Occasional declines in system yields may occur during day to day operation of the PSV5000 System. While overall yield levels can vary depending on device manufacture, any steep change in yields is sufficient reason for investigation of an immediate cause of variation.

These changes in yield can be attributed to a number of causes, including device quality control, socket issues, system maintenance, and process errors.

## Quality Control of Devices

Variations in the manufacture of devices may affect yields in an automated system, such as:

- Variation in dimensions from different manufacturing lots or facilities can cause devices to fit improperly in the sockets or require reteaching the Package File to be placed successfully.
- Presence of residual plastic on the edges of the devices (flashing) can cause devices to rest improperly in the sockets.
- Die changes (shrinks, process improvement for improved wafer yield, etc.) require new algorithms. Data I/O tracks these changes with vendors and recommends all customers subscribe to the algorithm update program.
- Die processes vary. Programming yields can sometimes vary on a normal die. Device families recently introduced to the market tend to have more fluctuations in yields until the semi-vendor's manufacturing process stabilizes.
- Multiple fabrication sites often produce the same devices. Performance characteristics, including programming yield, can vary from location to location.
- Lead oxide accumulating on device leads is an issue for some devices. This can vary with age and the storage conditions.
- Programming yields decrease with the number of programming cycles. Devices that are processed more than once are more likely to experience problems.

## Socket Issues

The programming sockets are perhaps the most important and vulnerable element of the PSV5000 System. They are subject to residue



Socket life is generally rated by the manufacturer as the number of insertions per socket after which yields may drop significantly.

buildup, damage from mis-inserted devices (perhaps due to poor calibration of the placement system), and general wear and tear.

Socket conditions that cause varying yields include the following:

- Debris of any type can prevent sockets from closing completely. Debris may not be visible. Simple actuation may clear debris, or it may be necessary to clean sockets with low pressure, clean dry air. Blow out sockets every day. Refer to *Inspecting the Socket Adapters* on page 98. Actuate the socket to blow out debris from beneath the contacts. More frequent cleaning is recommended in a dirty environment.
- Bent or distorted contact pins can cause intermittent socket failures.

## System Maintenance that Affects Yield

PSV5000 machine maintenance is critical to maintaining high yields. Periodic cleaning, adjustment and replacement of worn elements ensure the best possible performance. These periodic procedures are outlined in *Maintenance Schedule on page 4-2* and should be followed closely.

Part of regular maintenance is ensuring that the system hardware is in good working order, and that settings are accurate.

To check programmer hardware see *FlashCORE Programmer Diagnostics on page 119*.

For accurate placement, ensure that workspace locations (also known as a Package File) are taught correctly.

If throughput is down, perform Get Movetimes again: see *Optimize Movetimes on page 70*.

## Process Errors

Finally, some process errors can result in reduced yield. While an automated approach eliminates most human error during production, errors in setup or maintenance can result in reduced yield:

- Using old algorithms may affect programming yields. PSV5000 System algorithms are updated weekly at <http://www.dataio.com/algorithms/> and are available depending on your maintenance plan. Algorithms are updated via TaskLink or Job Creator. See the apropos online Help for more information.
- Selecting the wrong device part number for the job in TaskLink/Job Creator, and therefore the wrong algorithm.

- Selecting unintended programming processes in TaskLink/Job Creator (sector protection, security options, verify options, continuity testing, blank checking).
- Measuring yields too infrequently, so that a drop in yield rates is not detected until a large number of devices have failed.
- Using the wrong data file (selected in TaskLink/Job Creator).
- Socket abuse, such as digging failed devices out with sharp instruments.
- Changing to a questionable vendor source. Lower quality devices tend to produce lower yields.

## (Optional) Creating a Data File from a Master Device

The PSV5000 System can read data from a master device and create a data file (also called a *PC File*) that can then be used in programming jobs.

For complete instructions on creating a data file from a master device, see TaskLink (FlashCORE) or Job Creator (LumenX) online Help.

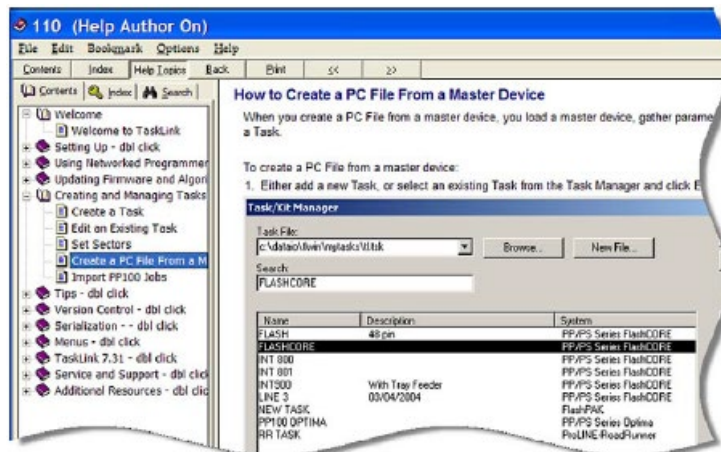


Figure 43: TaskLink’s online Help includes steps for creating a computer file from a master device.

## Marking Option



A Laser Module is an option which marks the surface of the devices. It has a separate Operation Manual which came you're your PSV5000 System if it has the option.



Figure 44: Manuals for the laser device marker and Fume Extractor.

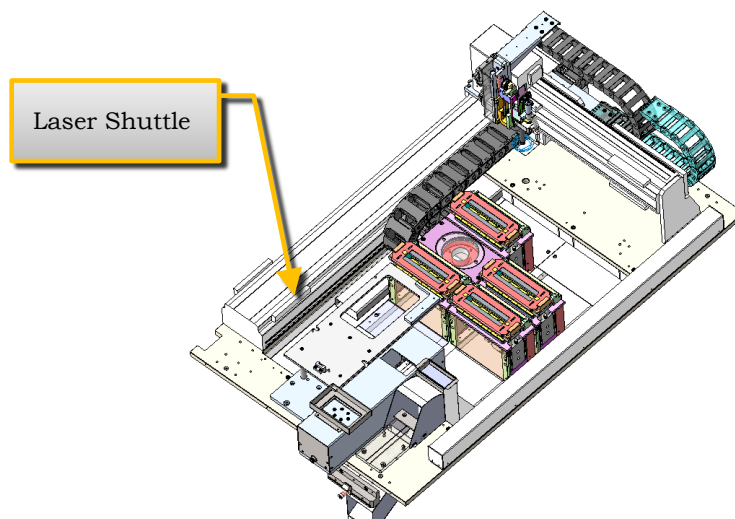


Figure 45: Laser marking uses a laser shuttle except when using Tape-Output. The shuttle is installed at the factory to transport devices to the laser beam.

## Installing the Laser Shuttle Module

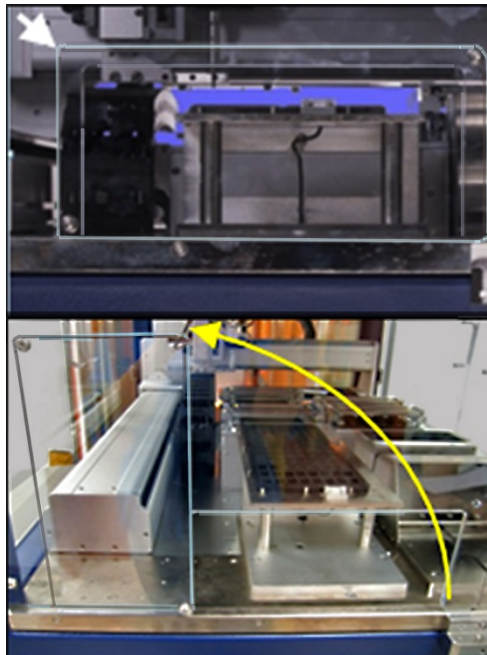
### TOOLS REQUIRED

Metric Hex Key set

To install the Laser Shuttle Module:

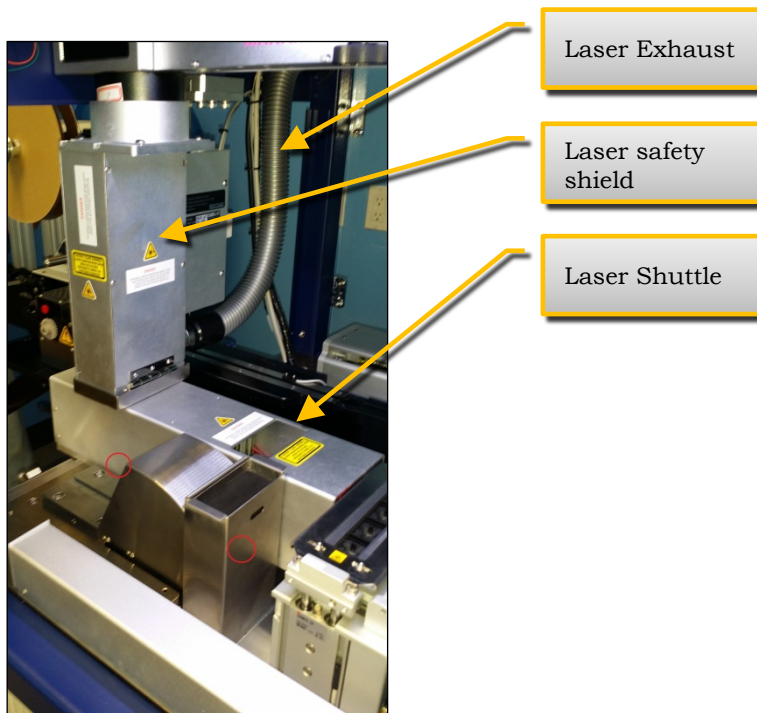
1. On the left side of the machine prepare the small clear safety covers for receiving the Laser Shuttle Module.

- a. Loosen the screw on the lower left of a rectangular safety shield shown in Figure 47: (4 mm hex key).
- b. Unscrew the top screw (4 mm hex key).
- c. Rotate the rectangular shield counterclockwise 90° to the 'storage' position and screw it to the fixed safety shield with the screw you just removed. Refer to the figure below.



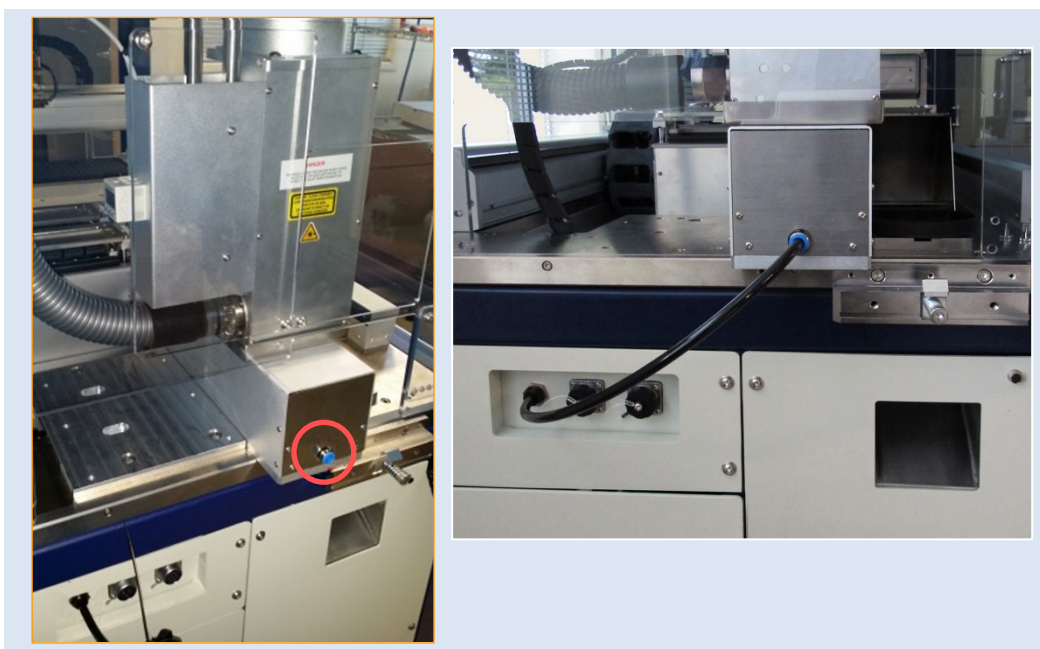
**Figure 46: To install the Laser Shuttle Module, rotate the shield counterclockwise 90°.**

2. Unscrew the five screws that secure large fixed safety shield (4 mm hex key).
3. Install the Laser Shuttle Module onto the plate in the PSV5000 workspace and screw it down with two screws (5 mm hex key) from the underside of the plate . See the figure below.



**Figure 47: Laser Shuttle fasteners are on the underside at approximately the two circled locations (near side only shown).**

- 4. Connect the air tube to the machine, two connectors are shown below.
- 5. Connect the communications cable to the left side of the machine.



**Figure 48: Left: the Laser Shuttle air connection (circled). Right: connected.**

## Creating a Laser Marking File

Laser graphics used to mark devices are generated using the MarkingMate software included with the Laser Option. It resides in the Laser Computer. Any style of marking (whether text-based, graphic-based, or both) can be generated and used for marking devices. The only limitation is the size of the device to be marked.

*NOTE: For instructions creating an image file for the Laser System, see:*

- *the Laser\_Configuration\_And\_Operation.pdf (customer letter 983-5075-001A.pdf) on the Handler PC if your programmer was ordered with the laser option, or see the software operation disc for the MarkingMate software.*
- *the CH700 on-screen Help topic Setting up and Teaching > Create a Laser Marking File.*

## Verifying Proper Laser Operation

**WARNING:** Possible health hazard from toxic fumes! Laser marking generates vapors, fumes, and particles that can be noxious, toxic. Follow maintenance procedures. Use proper ventilation.

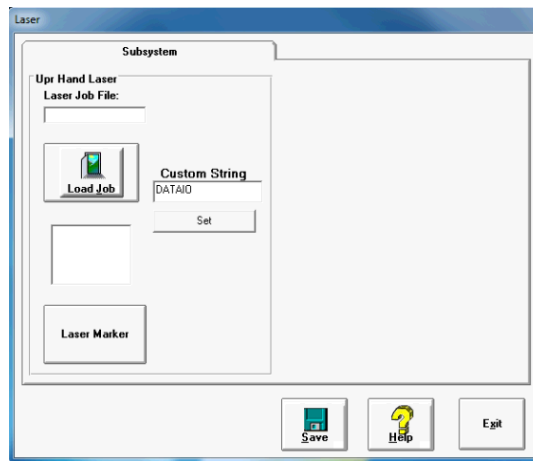
### REQUIREMENTS

- An image file is in the MarkingMate SW application.

To verify that the laser is marking as expected:

1. Put one device on the expected marking position.
2. At the Laser window, click Laser Marker. This device will be marked.





**Figure 49: Laser Form in CH700**

3. Verify that the marking graphic placement on the device is as desired. If not, adjust the laser file in the UpperHand application or see the next heading on troubleshooting.

## ALIGNING LASER MARKING

### REQUIREMENTS

- Two people
  - An image file is in the MarkingMate SW application. If the device is not marked, check that the laser is aimed at the device correctly.
1. Stop any job that is running by clicking Finish on the Run window.
  2. Turn off the Laser Switch in the Laser power control panel.

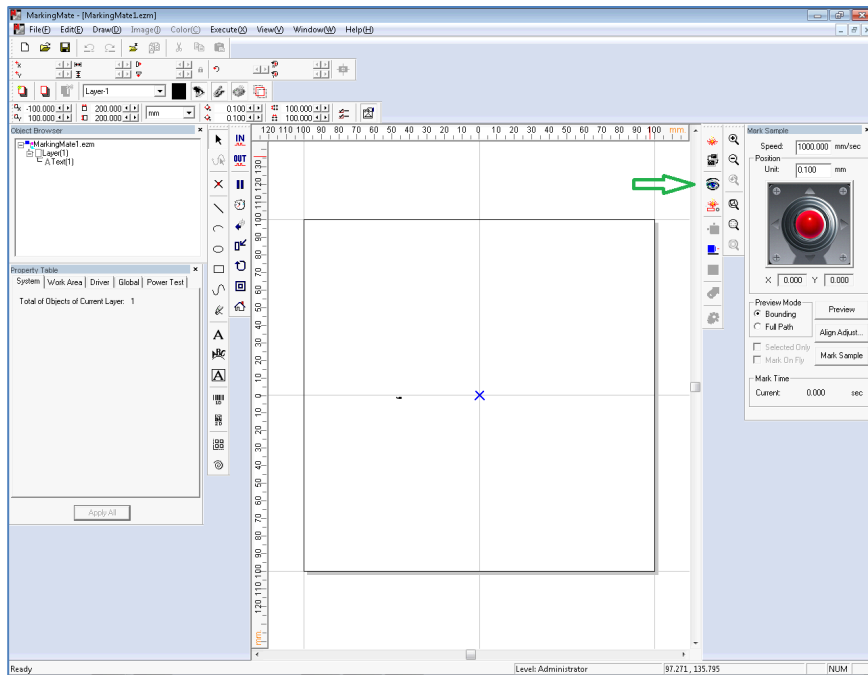


**WARNING:** Serious injury hazard to eyes and skin! Do not open or work on the Laser Module when the Laser Switch is in the ON position. Always make sure it is OFF.



**Figure 50: Laser Switch on the Laser power control panel.**

3. Open the MarkingMate software window (double-click the desktop icon).
4. Click preview icon in the MarkingMate software.



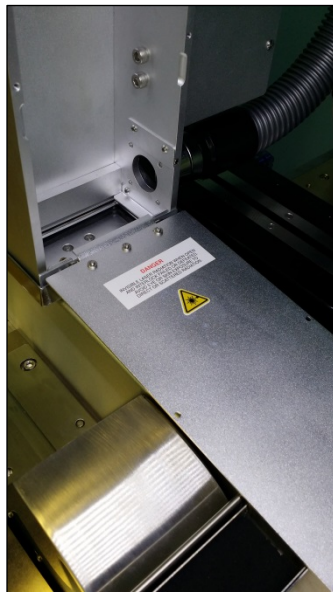
**Figure 51: The preview icon in the MarkingMate software**

5. Another operator open the PSV5000 front left safety door and unscrew the two screws on the inspection door of the Laser Module.



**Figure 52: Fasteners on the laser inspection door (arrows).**

6. Open the inspection door, which is hinged at the bottom, to view the laser position (red rectangle).



**Figure 53: Inspection door in the open position.**

7. Use arrow key on the keyboard to move the laser position (red rectangle) to the desired position, lift the door open and recheck.

---

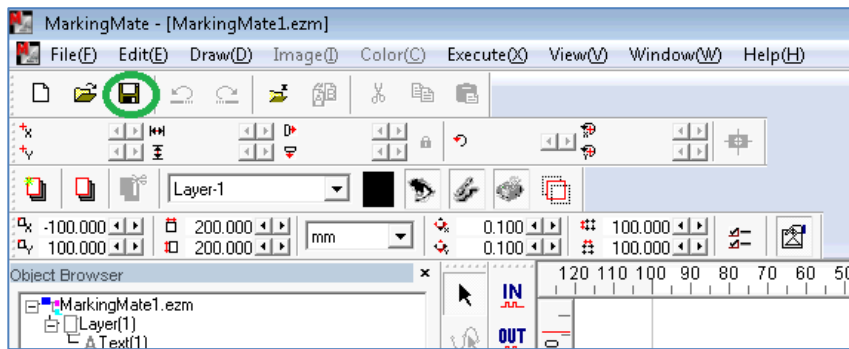
**Note:** *If the rectangle can't move, make sure the laser pattern in the MarkingMate software is selected.*

---



**Figure 54:** If laser is activated, there will be a red spot at location of the arrow.

8. Save the changes in the MarkingMate software.



**Figure 55:** Save icon in MarkingMate software.

- 9. Install the inspection door to the previous position.
- 10. Turn off the Laser Switch in the Laser power control panel.
- 11. Retry marking device. Refer to the previous heading.

If all appears correct and still there is no mark, contact Data I/O Customer Support.

---

**Note:** The Laser rotor has been leveled at the factory. If you experience trouble, contact Data I/O Customer Support.

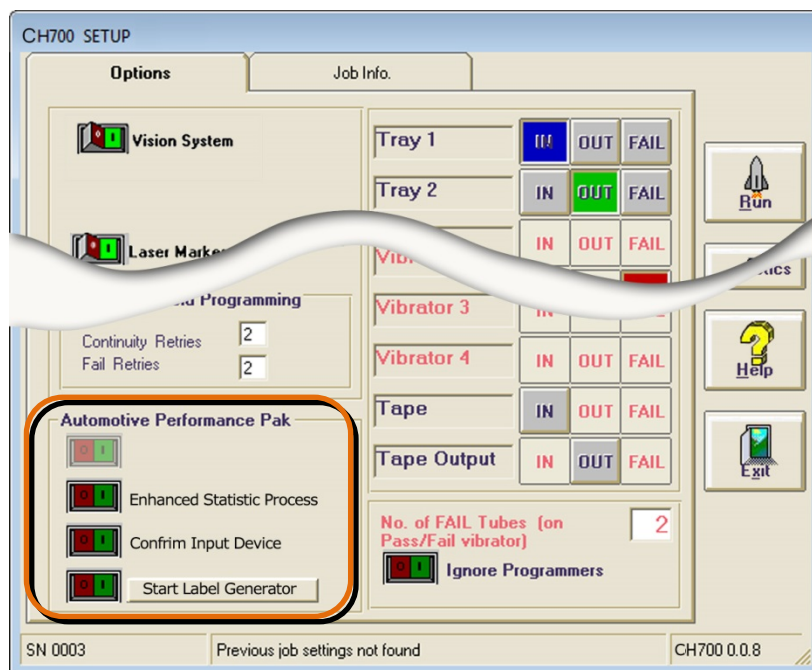
---

# Additional Features

## Automotive Performance Pak

Data I/O offers several utilities that are especially useful to certain industries. These utilities, labeled the Automotive Performance Pak (AP Pak), are described below. If your PSV5000 System does not have this feature, it can be ordered and installed.

Contact Data I/O Sales.



**Figure 56: The Automotive Performance Pak features appear in the Setup window.**

### AUTOMOTIVE PERFORMANCE PAK SOFTWARE DESCRIPTIONS

The Automotive Performance Pak (AP Pak) includes the following software and hardware components.

#### ENHANCED STATISTICS

The Enhanced SPC (Statistical Process Control) application is a standard feature on CH700 and allows precise tracking of machine behavior such as uptime, downtime, yields, and throughput. It produces job log files that are readable with Microsoft® Excel and Access software to graph the data. (Excel and Access required.)

### **CONFIRM INPUT DEVICE (AP PAK OPTION)**

This safety enhancement checks that the input device is the correct one for the job each time the input media is changed. When a job starts or when the input media (such as Tape-In or Tray Feeder) is empty, a barcode must be scanned to continue. This barcode must match the value setup in the TaskLink task. Typically, it is the raw material part number of the devices.

### **LABEL GENERATOR (AP PAK OPTION)**

This separate application is a utility for designing labels for reels of device tape or other media. Choose size, number of fields, and layout. Call up variables from TaskLink or enter new content. Print on-demand or automatically after each reel of devices.

### **ORDERING AND INSTALLING**

Ordering the AP Pak involves sending Data I/O a number from the Setup window in CH700 with your purchase order. Data I/O will send a security file via return e-mail. Complete instructions along with the installation procedure are in the CH700 online Help: find *Automotive Performance Pak* in the online Help index.



## 4 — Chapter Four

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# Maintenance



A handy sign-off chart is at the end of this chapter.

Performing the maintenance procedures described in this chapter optimizes operation of your PSV5000 System, enhances longevity by minimizing wear and malfunctions, and reduces any downtime.

The manuals that came with any optional equipment on your system may contain additional maintenance procedures.

---

**Note:** Only individuals trained on these procedures by Data I/O or its representatives are qualified to perform maintenance on the PSV5000 System.

---

This section describes the preventive maintenance schedule for the PSV5000 System and equipment options, with topics appearing in this order:

*Maintenance Schedule starting on the next page*

*Workspace, Head and Gantry on page 98*

*Programmers on page 119*

*The Laser Module on page 124*

*Handler Computer on page 129*

*Troubleshooting on page 131*

*Tape Output System Maintenance on page 140*

*Tray Feeder on page 148*

## Maintenance Schedule





Make copies of this chart and post near your work area.

This Maintenance Interval Chart below recommends intervals based on single-shift daily usage. Information about the specified procedures and intervals can be found on the pages referenced in the right column.

An asterisk (\*) denotes optional equipment.

Date completed / initials	Component	Action (see precautions also, on page listed)	Page
<b>Items to check Every Day</b>			
Every day	Sockets	Clean with dry compressed air. Check for wear; replace if necessary. For HIC Socket Adapters, see more information in customer letter <i>Cleaning HIC Sockets</i> (PN 983-5053) on our web site <a href="#">Technical Library</a> . This link opens the PDF which lists cautions and suggested items, such as Cleaning brush (PN 5655500901) and ProGold Wipes (PN 5705500902).	page 98
Every day	Input air pressure	Verify the input air pressure at the regulator is within specifications and that it is constant, that is the Nm <sup>3</sup> /min. [Normal Cubic Meter/min.] (SCFM ) must be stable. For specifications, see <i>Connecting Air</i> on page 34.	page 34



Items to check Every Week are below			
Every week	Programmings	<p>To help ensure there are no problems with the programmer hardware, run the programmers' Self-test once a week at a minimum; more often is even better. The Power-On-Self-test (POST), which sets precision to a laser-trimmed reference, runs when programmers are powered up. This insures proper operation of the programmer's voltage sources.</p> <hr style="border: 2px solid red;"/> <p> <b>CAUTION:</b> Possible damage to programmers and devices! DO NOT TURN AIR OR POWER OFF to the PSV5000 Machine while a job is running.</p> <hr style="border: 2px solid red;"/> <p>A job must be Finished before turning OFF compressed air or electrical power. Wait for the gantry to park before turning OFF.</p> <p>Run the Self-test by either  <b>A)</b> turning the PSV5000 System power OFF properly and then ON (<i>Shutting Down the PSV5000 System on page 38</i>), or  <b>B)</b> turning OFF only power to the programmers, and then ON, with the <i>Programmer Power Switch</i> on the Power Panel. If there is a programmer issue, a message will display when the next job is run.</p> <div style="text-align: center;">  </div> <p>—Refer to the Operator's Manual for switch locations.</p>	
Continued- Every week			
Every week	General system	<p>Clean surfaces of equipment and all areas in workspace with a clean brush, cloth, or dry compressed air.</p>	Page 102
Every week	Probe tips, on the PNP head	<ul style="list-style-type: none"> <li>• Inspect the Probe Tip to make certain it can create a good vacuum seal on the device. Replace if probe tip is worn, cut, or damaged.</li> <li>• Clean the PNP Probe tips with alcohol wipes (Data I/O PN 570-0410-001) or a damp cloth.</li> </ul> <hr style="border: 2px solid yellow;"/> <p><b>Note:</b> Do not touch the probe tip with bare hands. Finger oils can cause small devices to stick.</p> <hr style="border: 2px solid yellow;"/>	Page 103

Every week	General system	Laser Marking*	<a href="#">page 124</a>
Every week	Tray Feeder*	Check the Tray Feeder for damaged or broken parts. Check the conveyor belt and the guides for dirt, nicks, or other signs of damage. For more information, refer to the Tray Feeder Operator Manual.	
<b>Items to check Every Month are below</b>			
Every month	Tray Feeder*	Clean and Inspect the Tray Feeder.	
Every month	Supply line air filter	Check the main air filter and replace if necessary. Drain fluid.	<a href="#">page 107</a>
Every month	Vacuum Generator filters at PNP head	Check vacuum generator filters; replace as necessary.	<a href="#">page 108</a>
<b>Items to check Every Three Months</b>			
Every Quarter	Camera	Clean the Camera glass cover.	<a href="#">page 102</a>
Every Quarter	LCD Display	(Quarterly or as needed) Clean the monitor with consumer-grade ammonia glass cleaner. Spray window cleaner onto a soft, lint-free cloth and wipe the screen. DO NOT APPLY liquids directly to the screen. DO NOT USE alcohol or industrial chemical cleaners.	
Every Quarter	Safety doors	Clean with damp cloth.	
Every Quarter	Probe stem O-Ring	Replace the O-Ring on the probe stem.	<a href="#">page 103</a>

Every Quarter	Gantry guide rails (every 100,000 devices or every three months, whichever comes first)	Clean and lubricate quarterly, or sooner if the gantry becomes noisy.	<a href="#">Page 110</a>
<b>Items to check Every Six Months</b>			
6-mos.	PNP head	Check; tighten if necessary.	<a href="#">Page 110</a>
Every 6-mos. or as needed depending on use	Laser Marking System* Fume Extractor	Clean the nozzle and extraction tube.  Replace the Pre-Filter.  Replace the main filter twice yearly, or whenever the Filter System alarm sounds and blinks the red lamp.	<a href="#">Page 126</a>
<b>Items to check Once a Year</b>			
Every year	programmers	Run conformance verification test using Data I/O's DAB. Or have a Data I/O Service Technician perform the test. Customers with an APS contract have some costs of the test covered in the agreement. • FlashCORE Programmers: DAB part number 910-2200-003 or higher. • LumenX Programmers: DAB Kit 910-2211-001A or higher.	<a href="#">Page 119</a>
Every year	Vacuum Generator silencers PNP head	Check vacuum generator silencers; replace as necessary.	<a href="#">Page 109</a>

\* Denotes optional equipment

## Materials Required for Preventive Maintenance

To perform preventive maintenance procedures on the PSV5000 System, in general you need the following materials.

---

**Note:** *Specific items are noted at each individual procedure.*

---

### GENERALLY REQUIRED ITEMS

- Lens cleaning paper (Data I/O PN 570041)
- Water dampened cloth for cleaning
- Isopropyl alcohol
- Antistatic cleaner
- Dry, compressed air
- Safety goggles
- Disposable protective gloves
- Particle (dust) mask
- SAE and metric hex socket wrenches and hex keys (Allen Wrenches). Data I/O hex key set PNs: Metric 565-0006-001, and Standard 565-0007-001
- Screw driver sets, flat and Phillips
- Metric open end wrenches for the probe tips
- Shop vacuum cleaner
- Self-Serve Spares Kit (page 97)

## Turning off the Systems


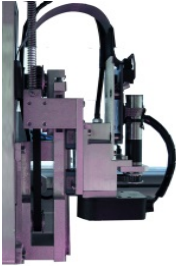



---

When the PSV5000 System will not be used for several days, or before performing a service procedure, turn OFF the system.

See *Shutting Down the PSV5000 System* on page 38.

## Self-Service Spares Kit

The Self-Service Spares Kit, Data I/O part number 952-0508-001 or higher, can be purchased at any time.

 <p>910-2200-00d or higher: Diagnostics Adapter Board (DAB) only for FC programmer calibration (Sales PN: FC-DIAGNOSTICS BOARD)</p>	
 <p>750-2474-001 or higher: an entire probe assembly</p>	 <p>480-0070-001 or higher: 16-port V-LAN Ethernet hub</p>
 <p>750-2464-001 or higher: programmer power supply</p>	 <p>2940220001 or higher: Pneumatic Silencer</p>

# Workspace, Head and Gantry

The workspace includes the Socket Adapters and items on the working surface, but not the programmers. They are covered in a separate heading.

## Socket Adapters and Actuation

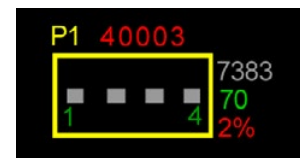
Under this heading you will learn about visually inspecting, cleaning and adjusting sockets, actuation, and air pressure for the workspace items.

### INSPECTING THE SOCKET ADAPTERS

The condition of the Socket Adapters has great throughput consequences.

#### SOCKET LIFE

The Run window displays the Socket Adapter lifetime actuation count in yellow until it is exceeded at which time it changes to red.



#### SOCKET CLEANING



**WARNING:** Vision hazard! Pressurized air or debris blown into the eyes or skin could cause bodily damage. Always use care and wear protective eye goggles when cleaning with pressurized air.

1. Use clean, dry compressed air (at 6.2 Bars (90 PSI or less) to remove dirt from the sockets. Open and close the sockets while blowing them out.
2. Check the sockets for wear and replace if necessary.

**Note:** The socket replacement cycle depends upon the type of socket used and the socket manufacturer.

### TURNING OFF INPUT AIR

Prior to turning off the input air, ensure that no job is running.



**CAUTION:** Possible damage to programmers and devices! DO NOT TURN AIR OR POWER OFF to the PSV5000 Machine while a job is

*running. A job must be finished before turning OFF compressed air or electrical power. Wait for the gantry to park before turning OFF.*

---

1. If a job is running, Pause or Finish it.
2. On the Power Panel, rotate the valve clockwise to turn OFF the input air; it is off when the lock rings line up. See [the figure below](#).



**Figure 57: Input air regulator/filter on the Power Panel (on the left side of the machine). When the lock rings on the valve line up, the air supply to the PSV5000 Machine is OFF.**

3. (Optional) Paddle lock the air shutoff valve.

### ADJUSTING THE SOCKET ACTUATOR AIR PRESSURE ON THE PROGRAMMERS

Socket Actuators are built into the FlashCORE programmers on PSV5000. Socket actuation is controlled by air pressure. If Socket Actuators are slamming up and down loudly, or devices are bouncing, the air pressure may be too high. If the PNP head does not properly pick or place a device in a socket because the socket is not opening completely, the air pressure might be set too low.

Adjust the air pressure setting as follows:

1. Finish a job if one is running.
2. Navigate to the Gantry window and click the yellow label for a programmer that is easy to see.
3. At the Actuator Tab, click Actuate Socket ON and OFF to visually verify performance for reference.



**Figure 58: The Socket Opener Pressure Control knob with built-in gauge on the Power Panel.**

4. At the Power Panel on the left side, adjust the air pressure up or down as desired by pulling the collar on the black knob out and then rotating it.
5. Push the collar back in.

---

**Note:** *The lowest pressure setting that opens the sockets all the way reliably is recommended.*

---

6. Cycle the sockets as before to verify the change in action.
7. Repeat if necessary.

---

**Note:** *If Socket Actuator problems persist, set the actuator speed (refer to the next heading).*

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### ADJUSTING THE SOCKET ACTUATOR SPEED ON THE PROGRAMMERS

THE SOCKET ACTUATOR SPEED WAS SET AT THE FACTORY AND SHOULD NOT NEED ADJUSTMENT. If it is determined that adjustment is necessary, this procedure requires a Data I/O trained technician since it requires having an access door open while the machine power is on.

#### REQUIREMENTS

- Programmer air pressure must be correct. See previous heading.
- Small flat screw driver.

#### TO ADJUST THE SPEED OF THE SOCKET ACTUATORS:

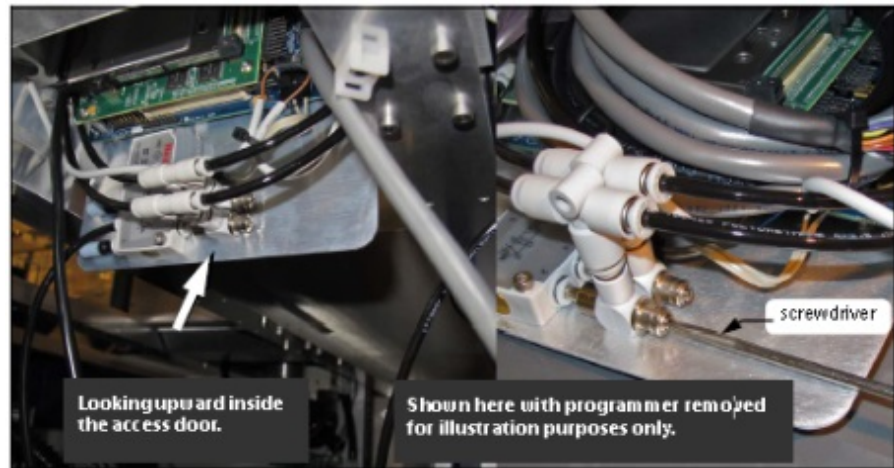
1. Ensure that power and air are connected and ON, and a Socket Adapter is installed on the target programmer.
2. At the Gantry window, click the label for a programmer with the adapter installed. Probe 1 will stop over socket 1.





**WARNING:** Electric shock hazard! Opening any access doors while the power is ON can be dangerous even when steps instruct you to do so. Use extreme caution and do not touch any electronic equipment except as directed.

3. Open the access door nearest the target programmer and locate the in-line air flow control for the up (sockets closed) position. Refer to [Figure 4-3](#).



**Figure 59: Actuator flow controls (arrow). The lower one (that the screwdriver is at) sets the UP speed. FlashCORE programmers shown here.**

4. Adjust the appropriate flow control 1/2 to 1 revolution clockwise for slower action, or counter-clockwise for faster action.
5. Close the access door, and clear the door open warning on the monitor.
6. At the Actuate tab of the Gantry window, click the Actuate Socket switch to ON while listening and watching the opener. If it is too fast it will produce a louder noise than optimum when it operates. If it is too slow it will look slow.
7. Click Actuate Socket OFF.
8. Adjust the flow controls as necessary and repeat the test.
9. Perform the same procedure for the other flow control if necessary.

## Cleaning the PSV5000 Machine

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### GENERAL MACHINE CLEANING

General cleaning should be performed on a weekly basis. General cleaning includes, but is not limited to, the following listed item.



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**WARNING:** Vision hazard! Pressurized air or debris blown into the eyes or skin could cause bodily damage. Always use care and wear protective eye goggles when cleaning with pressurized air.

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1. Remove all dropped devices, debris, and other materials from all working areas.
2. With air and power OFF, remove all devices and materials that may have fallen inside the machine.
3. Use dry, compressed air to remove all dust and debris from the work surface and from under the machine.
4. Dust the safety doors, inside and outside, with an antistatic cleaner.
5. Wipe the top and side panels to remove grease, fingerprints, and dust.
6. Dust the top surfaces of the input/output modules.

### CLEANING THE CAMERA COVER

Fingerprints and excessive amounts of dust or other residue on the camera cover will affect the alignment.

If the camera can't provide a good image, it may be an indicator that the cover needs cleaning.

Wipe the camera glass in the work surface with a soft cloth and isopropyl alcohol.

# Pick and Place Probe

The workspace Pick and Place head (PNP head) has one probe which requires periodic maintenance. The headings below describe maintenance.

## Checking the Probe Tip

A worn or damaged probe tip on the PNP head can cause dropped devices and placement problems.

1. Check the probe tip for cracks or tears. If necessary, replace with a probe tip of the same size.
2. Test the probe tip—
  - 2a. At the Setup window, click System > Gantry.
  - 2b. Click the Vacuum switch to ON.
  - 2c. Open the safety door and place a device on the target probe.
  - 2d. If the vacuum does not firmly hold the device, replace the probe tip with a probe tip of the same size.

### CHECKING THE PROBE

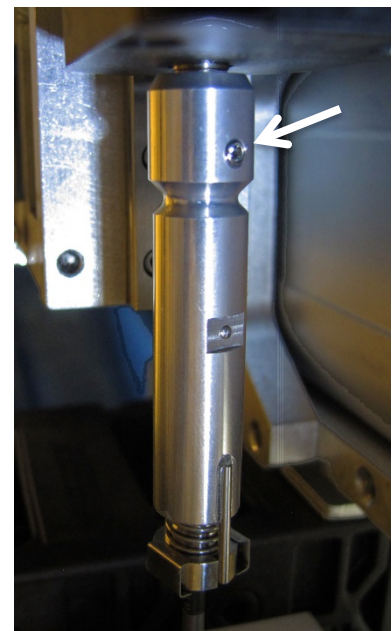
Check that the probe is not loose. Tighten the set screw on the stem if necessary. If you suspect or hear an air leak:

1. Remove the set screw on the probe stem.
2. Pull off the probe stem and check the O-Ring. Replace if necessary.
3. Reassemble.

### CLEANING THE PROBE TIP

To clean the Probe tip:

1. Move the PNP head to a convenient position by clicking one of the yellow labels on the Gantry window. The Tool position is recommended.
2. Open the safety door.
3. Wipe the tip with alcohol wipes (Data I/O PN 570-0410-001) or a damp cloth.



**Note:** Do not touch the probe tip with bare hands. Finger oils can cause small devices to stick.

## Adjusting Probe Blow-Off Pressure

**Note:** The flow controls are set at the factory and should not require adjustment. If adjustments need to be made, they should be done in small steps until the desired results are reached.

*Blow-off* is a small puff of air applied at the probe during the device drop event to assist in removing a device from the probe. *Blow-off* is produced by a vacuum generator on the PNP head. If set too high, *blow-off* could cause device misalignment during placement.

### TOOLS REQUIRED

- Large flat screwdriver
- Very small flat screwdriver

To adjust blow-off pressure on any vacuum generator:

1. Click System > Misc. I/O.
2. At the I/O Interface window, select the desired vacuum generator, probe 1 or probe 2 (or both).
3. Click Vacuum to the OFF position. Refer to Figure 4-4.
4. Click Blow-off to the ON position.

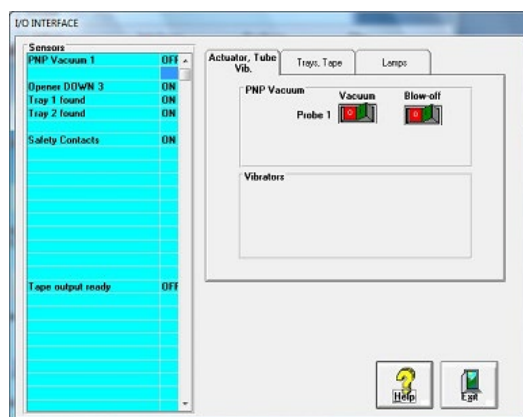


Figure 60: Vacuum and Blow-off on the I/O Interface window.



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

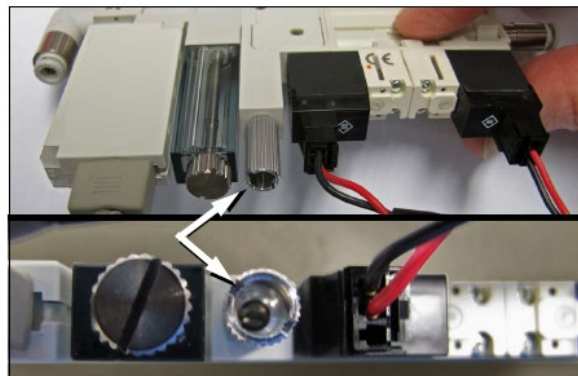
workspace.

When working within 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.

Ensure that a job is Paused or Finished, or the system power is OFF prior to opening any safety doors.

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5. Locate the actual vacuum generator (Data I/O PN 815-0047-001) on the right side of the PNP head. Find the blow-off adjustment set-screw. It is inside a long knurled stem which needs to be loosened before adjusting the set-screw. See the figure below.



**Figure 61:** The Blow-off adjustment set-screw on the vacuum generator is inside a knurled locking stem (arrow). (The vacuum block must NOT be removed as shown here.)

6. Turn the adjustment screw until the vacuum generator readout displays +1.5 to 2.0 kPa.
7. While holding the set screw with the screwdriver, tighten the knurled stem.
8. Do the same for the other probe.
9. Click Blow-off to the OFF position.

If you had a blow-off problem, test your results.

## Adjusting the Vacuum Generator Sensor

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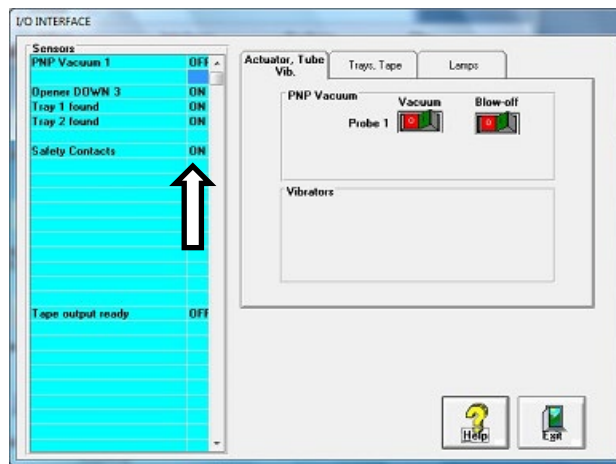
**Note:** If you notice consecutive programming pick errors, before adjusting vacuum sensors complete the Z-Axis adjustment. For instructions on Z-Axis adjustment, see Teaching the Workspace Locations on page 69. If

completing the Z-Axis adjustment does not reduce or eliminate subsequent pick errors, complete the vacuum sensor adjustments described here.

Vacuum sensors on the PSV5000 System are adjustable. The I/O Interface window displays a list of the sensors in the PSV5000 System and the status of each sensor.

**Note:** The number of sensors on the PSV5000 System depends on the options installed.

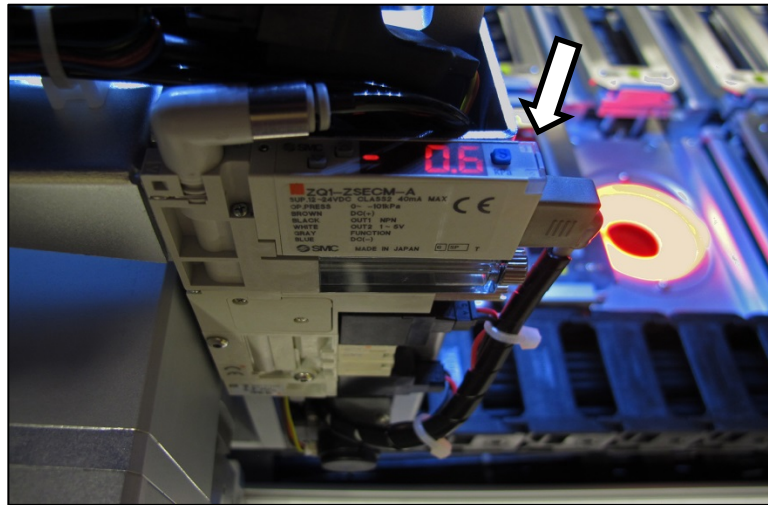
To view the status of sensors at the main CH700 Setup window, click System > Misc. I/O.



**Figure 62:** The I/O Interface window reports sensor status and allows switching options on or off.

#### TO ADJUST PROBE VACUUM GENERATOR SENSORS:

1. Finish a job.
2. At the Gantry window, move the PNP head to the Park position.
3. Close the Gantry window and at the System window click Misc. I/O.
4. At the I/O Interface tab, click the Vacuum toggle ON and the Blow-off toggle OFF. Refer to the figure above.
5. Open the rear safety door.
6. With a device or clean finger, plug probe tip 1 and ensure the green generator lamp comes on. See the figure below.



**Figure 63: The PNP Probe vacuum generator adjustments. (Looking in from the back of the machine) the vacuum generator faces up. The green lamp (arrow) is currently off.**

7. Read the high and low values each time you plug the air with your finger and release it. They are needed for the next step.
  8. Set the trigger value on the sensor by pressing the S (blue SET) button on the vacuum generator block and then using the UP or DOWN buttons, set the value to midway between the high value and the low value. It should be approximately -40 kPa.
  9. Press the SET button again.
  10. Check adjustment by blocking and unblocking the probe tip several times and ensuring the green lamp goes on and off each time.
  11. Repeat these steps for probe 2.
  12. Turn OFF the vacuum switch for the probe.
- Wipe the probe tip with a clean dry cloth.

## Replacing the Input Air Filter

1. If a job is running, Pause or Finish the job.
2. Turn off shop air and disconnect the input air line from the Air Filter/Regulator at the quick connect fitting.
3. Unscrew the air contamination collection bowl housing.
4. Pull off the clear collection bowl. Clean out any dirt, oil, or water.
5. Unscrew the black knob below the filter.
6. Pull off the filter. Clean or replace as necessary.

Reinstall in reverse order being careful not to damage the O-Ring on the bowl.

Reconnect the shop air supply line.



**Figure 64: Replacing the Air Filter/Regulator.**

## Vacuum Generator Filters and Silencers

These procedures cover removing and cleaning or replacing vacuum generator parts for vacuum generators on PSV5000 head.

A clogged or dirty vacuum filter or silencer can cause dropped devices and placement problems at the PNP head.

### **REQUIREMENTS**

- metric hex key set
- flat screwdriver
- small Phillips screwdriver

### **VACUUM GENERATOR FILTERS**

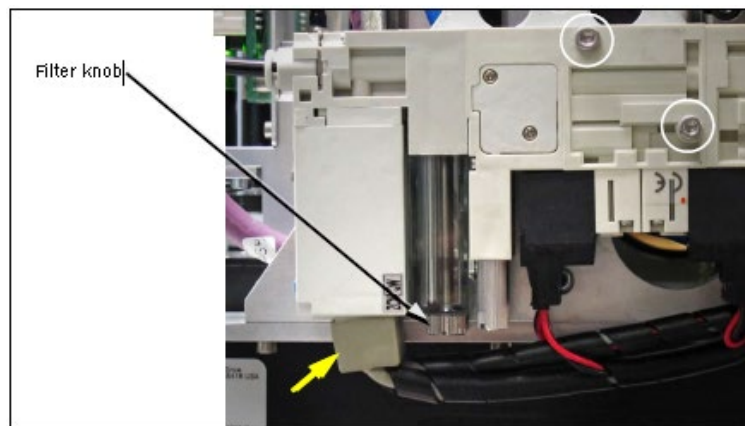
1. Finish a job if one is running.
2. Use the Gantry window to move the PNP head to an accessible location such as the Tool position.
3. Properly shut OFF the PSV5000 System. See *Shutting Down the PSV5000 System on page 38*.





**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. Open the front safety door and mark the wire connectors at the two vacuum pressure switches on the right side of the head for returning them to the correct location.
5. For access, unplug the two wire connectors (just marked) by pulling them out. See Figure 66: below.
6. With a flat screwdriver, unscrew the knurled fastener on the underside of the nearest filter housing. See the figure below.
7. Remove the filter housing and ensure that the O-Ring doesn't fall.
8. Remove the filter from the housing. It should be white or nearly white. If dirty or clogged, replace with new filter (Data I/O PN 294-0219-001). See the figure below.



**Figure 65: Removing the PNP head Vacuum Generator filter. The yellow arrow points to the wiring connectors. Two fasteners attach pneumatic generator block (circled).**

Reinstall in reverse order and plug the two wire connector back in at the same location.

### VACUUM GENERATOR SILENCERS

There is a silencer in the vacuum generator block at the PNP head. To inspect or replace the silencer:

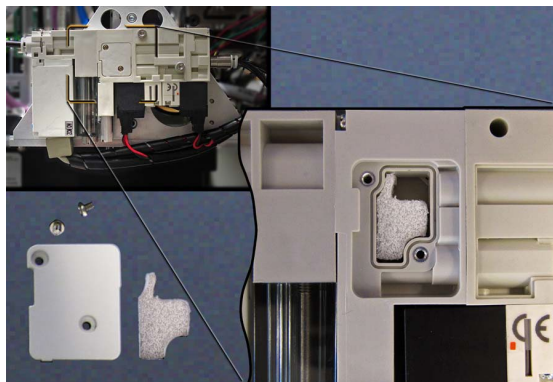
1. Finish a job if one is running.
2. Use the Gantry window to move the PNP head to an accessible location such as the Park position.

3. Properly shut OFF the PSV5000 System. See *Shutting Down the PSV5000 System* on page 38.



**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. Open the safety door and remove the small silencer cover plate on the accessible vacuum generator (two 1.5 mm hex key).



**Figure 66:** The vacuum generator silencer. It is included in the Self-Service Spares Kit.

5. Inspect the silencer. If it looks dirty—not white—replace it.
6. Replace the cover plate.

## Inspecting Gantry Parts

### CHECKING THE PNP HEAD

1. Properly shut OFF the PSV5000 sub-systems and machine power. Refer to *Shutting Down the PSV5000 System* on page 38.
2. Check that all connectors are secure.
3. Turn on the system air and check that there are no vacuum leaks.

### LUBRICATING THE GANTRY

There are a total of seven grease ducts on the gantry for lubricating the linear guides. Additionally, the ball screw requires lubrication periodically, also.

## REQUIREMENTS

- AFB - LF from THK Grease
- hex key set (Allen wrenches)



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

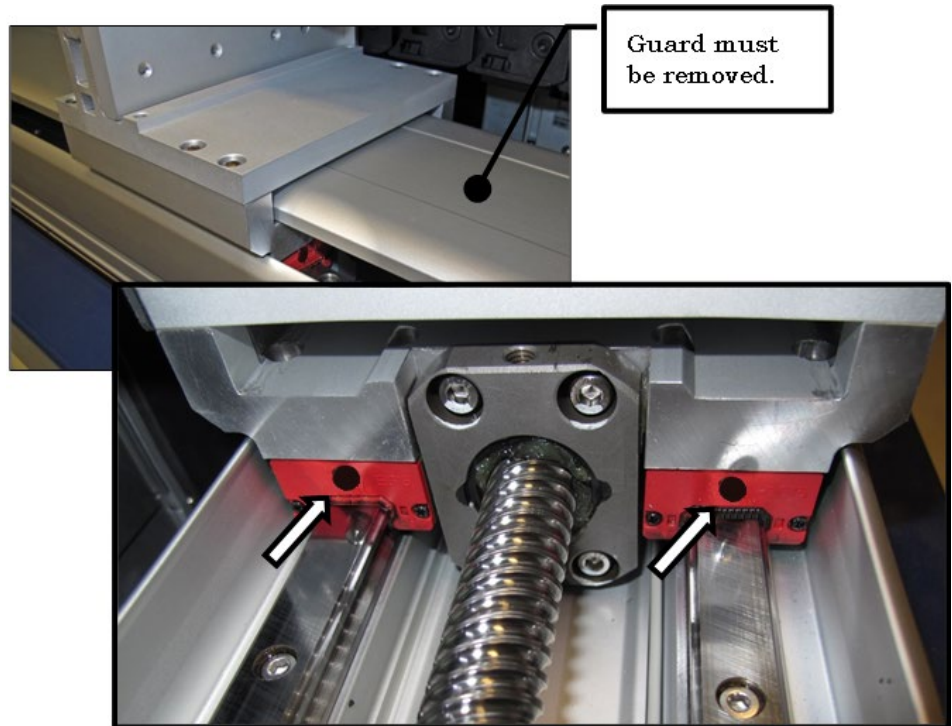
When working within the machine workspace, moving the PNP head must be the responsibility of only one qualified individual. All others must stay clear of the machine controls to prevent injury to that person. Ensure that the system power is OFF prior to proceeding.



**WARNING:** Possibility of serious eye damage! AFB LF grease causes serious eye irritation. Wear eye protection goggles.

## GANTRY X-AXIS LUBRICATION

1. Move the PNP head to the Park position.
2. Properly shut OFF the PSV5000 sub-systems and machine power. See Shutting Down the PSV5000 System on page 38.
3. The guard on the back linear guide must slide out to the left or right. Therefore, remove either the left or right clear workspace side panel. Remove the four screws (4 mm hex key) and lift the panel off.
4. Open the rear safety doors and remove the four screws in the gantry guard with a 2.5 mm hex key.
5. At the open side of the machine, lift the end of the guard slightly and pull it out of the workspace.
6. Remove the two screws covering the grease ducts.
7. Apply grease to the two grease ducts on each end of the slide block (as shown on the next page). Wipe off any excess.
8. Replace/insert the screws removed from Step 6.



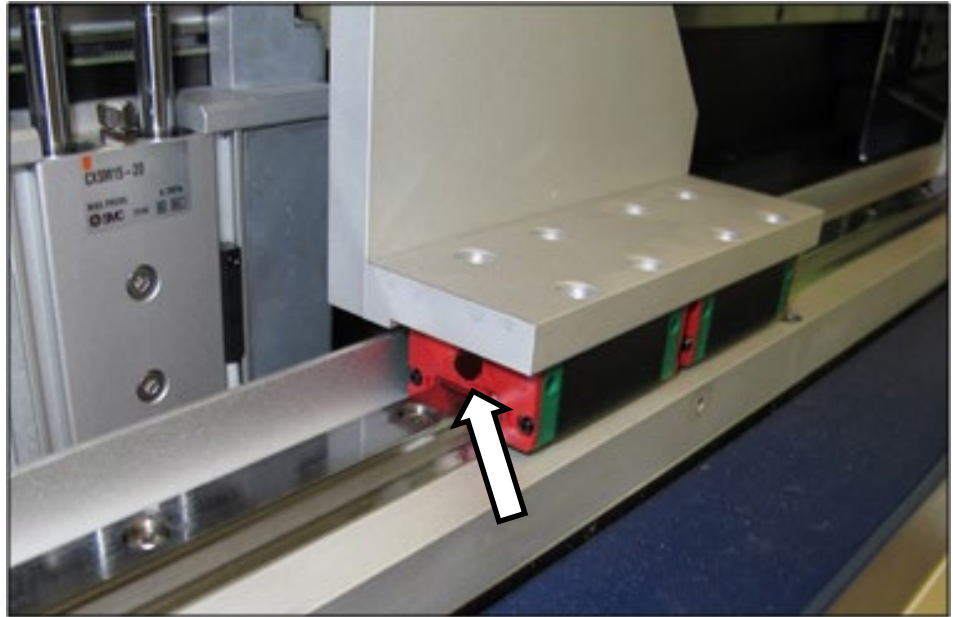
**Figure 67:** Two of the four grease ducts on the rear linear guide of the gantry.

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**Note:** Too much grease may cause grease to splatter inside the work envelope. Do not over-apply the grease.

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9. Lubricate the rear ball screw after wiping off the old grease. Directly apply new grease to the ball screw sparingly. Wipe off any excess.
10. Open the front safety doors and remove the four screws securing the front guard of the front linear guide of the gantry (2 mm hex key).
11. Remove the screw covering the grease duct.
12. Apply grease to the grease duct on each end of the slide block. Wipe off any excess. See figure below.

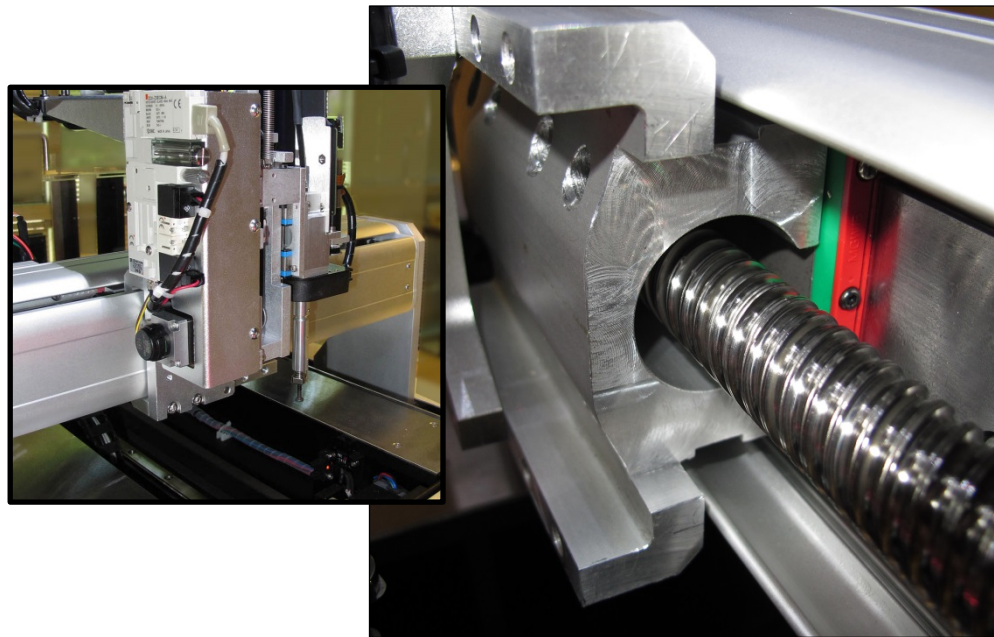


**Figure 68:** One of the two front gantry rail lube ducts. Note that the guard has already been removed.

10. Lubricate the front ball screw after wiping off the old grease. Directly apply new grease to the ball screw sparingly. Wipe off any excess.
11. Replace all screws, guards, and shields.

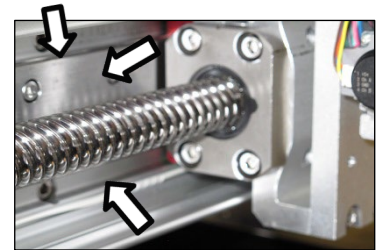
#### **GANTRY Y-AXIS LUBRICATION**

1. Open the front and rear safety doors and remove the four screws securing the guard of the Y-axis linear guide (2 mm hex key).
2. Slide the guard out from either the front or back after pulling slightly to clear the end cap.



**Figure 69: The Y-axis gantry ball screw and guide block, with cover (left) and without.**

3. Apply grease directly to the linear guide. Wipe off any excess.
4. Lubricate the Y-axis ball screw after wiping off the old grease. Directly apply new grease to the ball screw sparingly. Wipe off any excess.
5. Replace all guards and shields.



## Replacing a PNP Probe Assembly

Technicians trained on the PSV5000 can remove and re-install a Probe Assembly if it is damaged or malfunctioning.

### Requirement

- Metric hex key set (Long set with extended reach is best)
- Spare Probe Assembly

### To remove a Probe Assembly

1. End a job and move the PNP head to the PARK position (click System > Gantry > Tool) to move it to an accessible position.
2. Properly shut down the PSV5000 System; refer to Shutting Down the PSV5000 System on page 38.



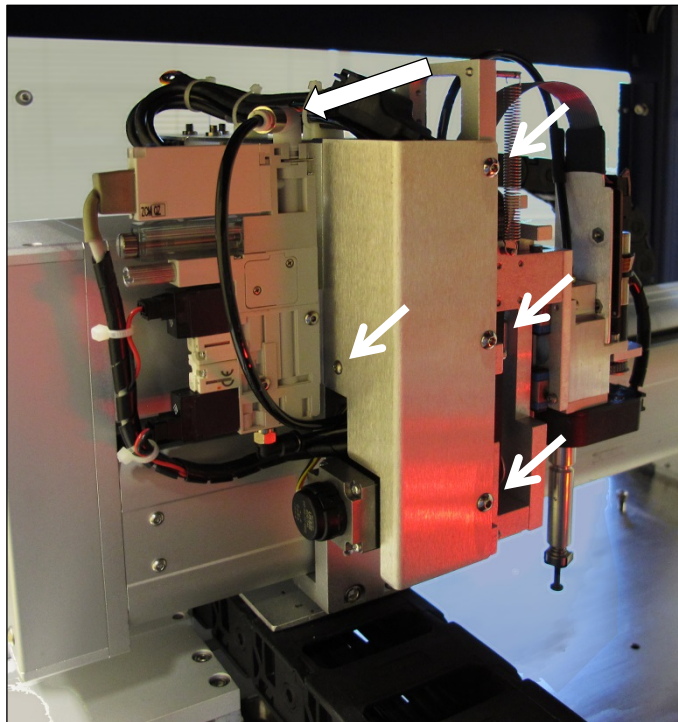
A spare Probe Assembly comes with the Self-Service Spares Kit.



**CAUTION:** Possible Machine Damage! The PNP head and gantry can be damaged by pushing or pulling it improperly.

- When moving the head, only push or pull by gripping a gantry part and not the head.

3. Remove the probe from the Probe stem. Refer to *Installing the Correct Probe* in the PSV5000 Operator's Manual.
4. Disconnect the air hose from the vacuum generator (shown in the figure below) by pushing on the collar while pulling the tubing.



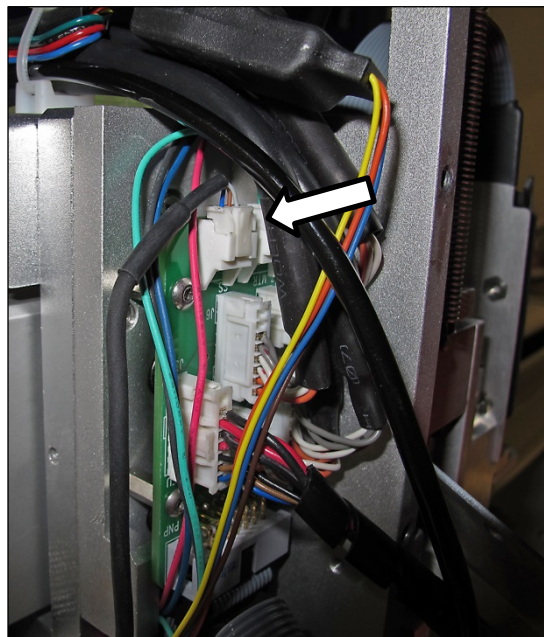
**Figure 70:** Remove the air line at the One-Touch air connector at the top of the assembly. Remove bracket fasters (arrows).

5. Remove the bracket with the vacuum generator attached; four screws; three use 2.5 mm hex key, the back one uses 2 mm hex key. See Figure 71: .
6. Unplug the ribbon cable from the back of the head assembly by pulling down on the connector.



**Figure 71: Unplug the ribbon cable from the back.**

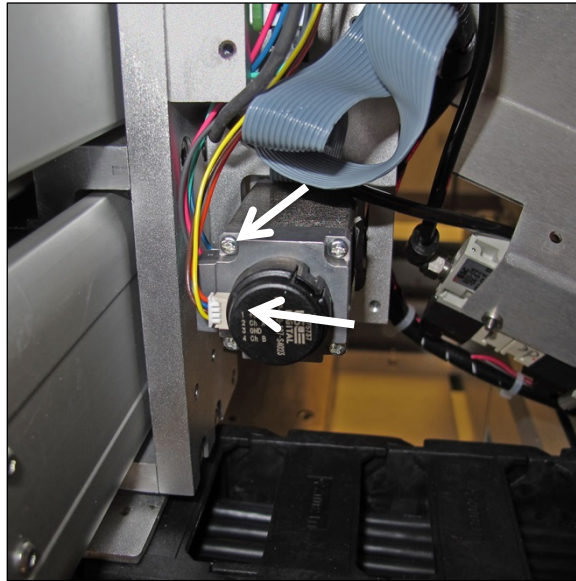
7. Disconnect the small connect at the top of the assemble by pinching the clip and pulling up.



**Figure 72: Top connector on the P robe Assembly.**

8. Remove the four fasteners that hold the Probe Assembly to the PNP head. Refer to Figure 71: (A long 2.5 mm hex key is required.)
9. Disconnect and remove the Z-axis retention spring (front side of assembly).
10. Remove two wire connectors from the back of the motor. See Figure 74: .





**Figure 73: Rear view of motor with two connectors (arrows). Note that the yellow wire is on the bottom of the small connector.**

11. Carefully pull the Probe Assembly with air tubing and wiring toward the front of the machine.



**Figure 74: Probe Assembly is removed with the tubing and wires still through the head mount.**

### REINSTALLING THE PROBE ASSEMBLY

Generally, the reinstallation is in the reverse order of removal with these precautions:

- Remember to thread the cables/tube through the head bracket.

- Ensure the ribbon cable doesn't get pinched behind the probe assembly.
- Make sure the Probe Assembly mates up to the locating pin on the head bracket.
- It's easiest to connect the two motor wires after putting the head onto the bracket but before screwing it in place.
- Make sure tubes and wires are securely stowed and fixed to avoid being rubbed by any moving parts.
- Remember to re-install the retention spring.

# Programmers

FlashCORE programmers require some maintenance to continually program at the highest yields.

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*Note: For LumenX Programmer diagnostics refer to Customer Letter 983-5085-001A. Check our website Technical Library.*

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It is NOT necessary to restart programmers between jobs.



## FlashCORE Programmer Diagnostics

To optimize programming yields, voltages within the FlashCORE programmer need to be calibrated **once each year**. This is a more thorough HW test than the 'POST' (Power-On-Self-Test) as well as ensuring that each programmer's precision reference is still within its specified operating range.

Annual programmer Compliance Verification (CV) can be performed by Data I/O at customer sites. This on-site visit is included if you have an APS (Annual Programmer Support) contract (customer pays travel costs).

Optionally, customer can purchase a Diagnostic Adaptor Board (DAB) and perform the compliance diagnostics themselves. Contact sales to purchase a DAB.

### Tools required

- Diagnostic Adapter Board (DAB), Data I/O part number 910-2200-003 (or higher).

This Diagnostic Adapter Board detects problems related to FlashCORE (FC) programmer hardware failure. The DAB tests the Waveform Circuit Board and Backplane Circuit Board. The DAB can also be used to locate problems that have not yet shown symptoms.

The DAB performs these nine tests:

- Bus Test
- Adapter ID Test
- LED Driver Test
- G Node Test
- Vcc Overcurrent Test
- Vpp Overcurrent Test
- I2C Bus Test
- DAC Calibration Test
- Gslew Test

## RUNNING THE PROGRAMMER DIAGNOSTIC TEST

To run diagnostic tests on FlashCORE programmer(s):

1. Finish a job if one is running; wait for the PNP head to park.
2. Turn OFF the programmer circuit breaker at the Power Panel (down position).



3. Exit CH700 to return to TaskLink.



**WARNING:** ESD hazard! To prevent ESD shock, before you touch the Socket Adapter, discharge static electricity from yourself by touching a common ground or an unpainted metal surface.



The wrist strap Data I/O  
PN is 440-0021-001.

When at the PSV5000 Machine, always wear a wrist strap containing a 1 M-ohm min. to 10 M-ohm max. current limiting resistor. Connect the antistatic wrist strap to the grounding socket on the front or back of the PSV5000 Machine.

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

When working within 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.

Ensure that a job is Paused or Finished, or the system power is OFF prior to opening any safety doors.

4. Remove the Socket Adapter from the target programmer and insert the Diagnostic Adapter Board, ensuring that it aligns correctly on the adapter pins. Screw down the two bracket screws (4 mm hex key).
5. Turn the programmer circuit breaker at the Power Panel ON (up position).
6. Start TaskLink and click Tools > Run Programmer Diagnostics.

**7.** On the Diagnostics window, select the programmer with the DAB installed.

**8.** Click Test All.

The pass/fail test results are displayed in TaskLink and are also written to /fdrroot/system/diaglog.txt (and to the CF-card of the target FlashCORE programmer). These files can be viewed in TaskLink and saved (on the Handler Computer).

If any of the tests show Fail in the TaskLink display, contact your nearest Data I/O Service Center for repair options. To help our service personnel diagnose the problem, please e-mail both the eventlog.txt and diaglog.txt files.

[Sample dialog.txt file:](#)

Diagnostic Pass #1

Run Vpp Overcurrent test.

DUT 1 G1 Vpp overcurrent is sensed at 57 mA.

DUT 1 G2 Vpp overcurrent is sensed at 57 mA.

DUT 1 G3 Vpp overcurrent is sensed at 57 mA.

DUT 1 G4 Vpp overcurrent is sensed at 57 mA.

DUT 2 G1 Vpp overcurrent is sensed at 57 mA.

DUT 2 G2 Vpp overcurrent is sensed at 57 mA.

DUT 2 G3 Vpp overcurrent is sensed at 57 mA.

DUT 2 G4 Vpp overcurrent is sensed at 57 mA.

Error: DUT 3 G1 Vpp overcurrent is not sensed from 50 mA to 70 mA.

Error: DUT 3 G2 Vpp overcurrent is not sensed from 50 mA to 70 mA.

Error: DUT 3 G3 Vpp overcurrent is not sensed from 50 mA to 70 mA.

Error: DUT 3 G4 Vpp overcurrent is not sensed from 50 mA to 70 mA.

DUT 4 G1 Vpp overcurrent is sensed at 57 mA.

DUT 4 G2 Vpp overcurrent is sensed at 57 mA.

DUT 4 G3 Vpp overcurrent is sensed at 57 mA.


DUT 4 G4 Vpp overcurrent is sensed at 57 mA.

Diagnostics failed.

## Replacing a Programmer

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If a programmer is not working properly, it can be removed and replaced with another one. Within these instructions are notices where steps differ

for LumenX programmers—denoted by the logo. 

### TOOLS REQUIRED


- Cable Tie tool
- Clippers to cut cable tie
- 3 mm hex key (Allen wrench)
- Access door key that came with your PSV5000



**WARNING:** Electric shock hazard! Injury or death may result from contact to parts inside the machine. Shut off the PSV5000 System by turning OFF the main power switch before working on or near the gantry, before opening any access doors or removing any cabinet panels.

---

To remove a FlashCORE programmer:

1. Properly turn OFF the PSV5000 sub-systems and machine power. See *Shutting Down the PSV5000 System* on page 38.
2. With the supplied door key, open the lower, right front access door.
3. Locate the target programmer and follow the heavy gray power cable to the connection panel on the right side of the machine. Refer to [the figures below](#).
4. Mark the cable (to re-install in the same place) and pull the connector straight out from the PCB.  LumenX programmers have two connectors per programmer—mark and disconnect both.



**Figure 75:** The right side connection panel inside the right front access door. Power cables (black arrow), Pneumatic manifold (white arrow),

**FC** and the Ethernet connections (circled).

**LX** For LumenX, there is another separate Ethernet router, not shown in this view.

5. Follow and mark the thin shiny black tubing to the air manifold on the right mounting plate.
6. Disconnect the air tubing at the one-touch connector elbow (push in on the collar while pulling the tube out).

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*Note: Manifold port plugs must be installed into all ports that will not be used.*

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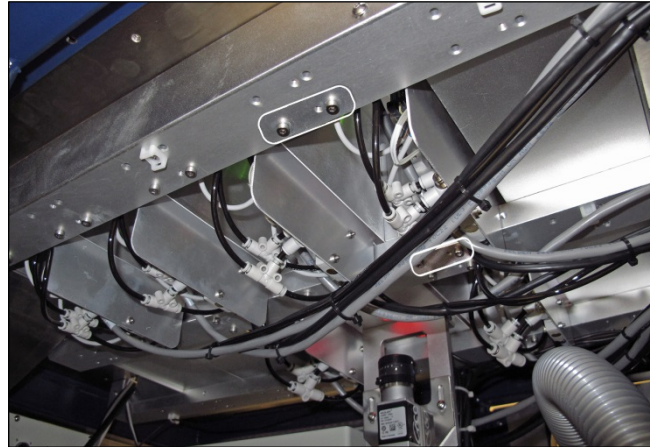
7. Follow and mark the Ethernet cable to the router :

**FC** on the right mounting plate (FlashCORE programmers).

**LX** mounted nearby (LumenX programmers).

8. Disconnect the Ethernet cable by pinching the clip and pulling up. Refer to Figure 76: .

9. Remove four screws (3 mm hex key) from the bottom side of the programmer (two nearside, two farside). One screw might also hold a cable tie which must be cut first. Save the cable tie mount for reuse (as well as the screws).



**Figure 76: Inside the machine looking up at the programmers. There are four attachment screws (circled) per programmer.**

**FC** FlashCORE shown, **LX** but LumenX is similar, with screws farther apart.

10. Open the front or back safety door to access the workspace.
11. Lift up on the target programmer being cautious of the cables that will come out with it.

Replacement is in the reverse order of removal.

## The Laser Module and Shuttle



**[Laser Marking only]** Laser Marker System is optional equipment on your PSV5000 Programming System. The Laser Module employs a laser shuttle (except when using Tape Output) and includes a fume extractor.

### The Laser Module

The Laser shuttle transports devices to and from the lasing area.

#### REQUIREMENTS

- Disposable gloves and protective goggles
- Sealable Plastic bags



- Antistatic cleaner
- Cloth Paper towels

## HOUSING



**WARNING:** Possible health hazard! Lased materials can contain hazardous toxins in the dust that cause eye and skin damage! DO NOT use compressed air to remove laser dust or any method that allows the particulate to be released into the work environment. Wear safety goggles and disposable protective gloves.

1. Properly shut off the PSV5000 sub-systems and machine power. See Shutting Down the PSV5000 System on page 38.
2. Wear eye protection and put on disposable protective gloves.
3. Use a damp cloth or paper towel and antistatic cleaner to wipe laser marking dust and other foreign material from the housing.
4. Place paper towels, cloth, and protective gloves into a sealable plastic bag. Seal the bag and dispose of as hazardous waste. Remove safety goggles.



**WARNING:** Possible health hazard from toxic materials! Government regulations apply to the storage of hazardous waste. Ensure that contaminated filters are:

- properly labeled and stored in your hazardous waste storage area
- not stored on your site longer than government regulations allow (the typical limit is 90 days)—check your government regulations for hazardous waste storage requirements.

## CLEANING THE LASER SHUTTLE TIP

Dirty tips may cause air leakage. Cleaning intervals depend on amount of use.

To clean the tips:

1. If machine power in ON, move the head: either  
 At the Run window: click **Pause** or **Finish**.  
 Or at the Gantry window: click **Park** or **Tool**.
2. Open the safety doors.

3. Wipe the shuttle tips with a damp cloth—soapy water is okay. (Do NOT use alcohols or solvents.)

## Laser Marking Fume Extractor

[**Laser Marking** only] All models with Laser Marking have a fume extractor. The fume extractor requires some attention as described below.

### START-UP



**CAUTION:** Possible health hazard! Dust from the main filter may be expelled on start-up after PSV5000 transportation. Turn the system ON in a room with appropriate ventilation or wear dust respirator and goggles.

The Fume Extractor starts automatically when the PSV500 Machine is started (unless the extractor has been manually turned off).



**WARNING:** Possible health hazard! Lased materials can contain hazardous toxins in the dust that cause eye and skin damage! DO NOT use compressed air to remove laser dust or any method that allows the particulate to be released into the work environment. Wear safety goggles and disposable protective gloves.

### CLEANING THE LASER MODULE AND FUME EXTRACTOR TUBE

The filter extraction tube should be cleaned occasionally for best flow.

Contact Data I/O Customer Support or a local Data I/O approved service representative.



**WARNING:** Health hazard! Failure to replace the laser vacuum filters at the required intervals could create a hazardous operating environment.



**WARNING:** Hazardous Materials—Possible health hazard! This procedure involves exposure to hazardous by-products from the laser marking process. Some device material may be carcinogenic.

Perform the following procedure only if you have training regarding laser etching processes or handling hazardous materials.

Wear safety goggles and disposable protective gloves..

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For both these procedures contact Data I/O Customer Support or a local Data I/O approved service representative.

### REPLACING THE FUME EXTRACTOR FILTERS

#### TOOLS REQUIRED

- sealable plastic bag (approximately .06 M3 [2 cu. ft.])
- protective gloves and goggles
- a particle (dust) mask
- access door key that came with your PSV5000
- UpperHand Fume Extractor Operation Manual

To replace the Fume Extractor Filters:

1. Properly shut off the PSV5000 sub-systems and machine power. See Shutting Down the PSV5000 System on page 38.



**WARNING:** Possible health hazard! Lased materials can contain hazardous toxins in the dust that cause eye and skin damage! DO NOT use compressed air to remove laser dust or any method that allows the particulate to be released into the work environment.

Some device material may be carcinogenic.

Wear safety goggles and disposable protective gloves.

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**WARNING:** Health hazard! Failure to replace the laser vacuum filters at the required intervals could create a hazardous operating environment.

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2. Wear eye protection and put on disposable protective gloves.
3. Open the front access door.



**Figure 77: The Fume Extractor inside the front of the PSV5000.**

4. To continue, see the replacement instructions and part numbers of the UpperHand pre-filter and main filter in the UpperHand Fume Extractor Operation Manual (that came with PSV5000).



**Figure 78: These four steps show filter replacement. Refer to the Fume Extractor Operation Manual.**

To finish, place the filters and your gloves in the bag and seal the bag and dispose of as hazardous waste. Close the access door.

# Handler Computer

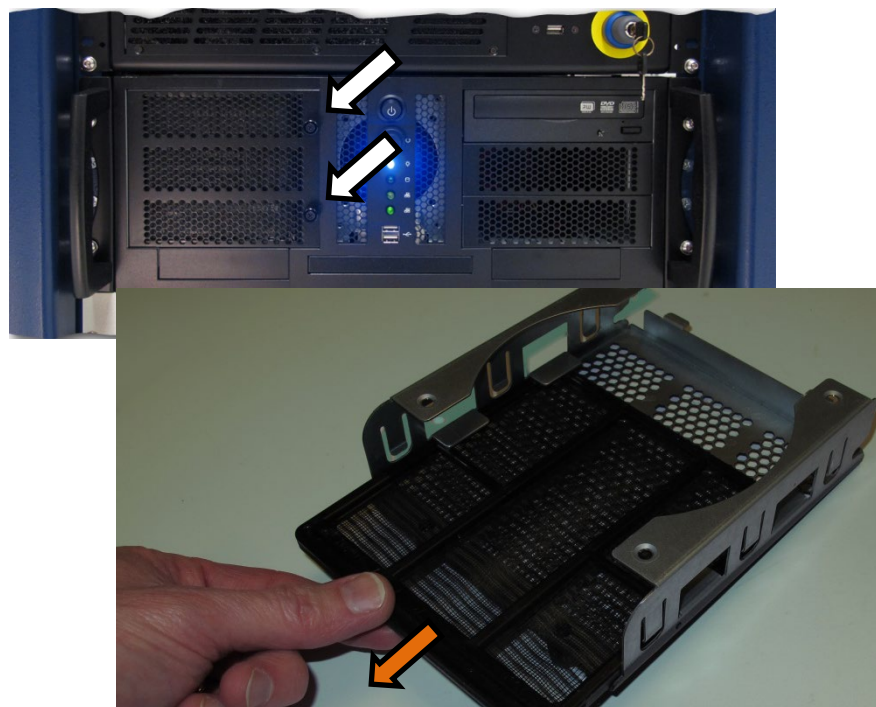
The main PSV5000 Machine computer, or Handler Computer, is at the left side of the machine and requires little maintenance.

## Handler Computer Air Filter

The Handler Computer has an air filter that requires periodic cleaning or replacing.

To remove the air filter:

1. Properly shut off the PSV5000 sub-systems and machine power. See Shutting Down the PSV5000 System on page 38.
2. Open the filter door by unscrewing the two knurled knobs. The Handler Computer filter door has two knurled knobs (white arrows). The filter (screen) slides out.



**Figure 79:** The Handler Computer filter door has two knurled knobs (white arrows). The filter (screen) slides out.

3. Open the filter door or lift it out.
4. Pull out the filter tray out of the door.
5. Clean filter as necessary such as with a light-duty vacuum.

## Installing CH700 Software Updates

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CH700 Software updates are periodically published with improvements. Delivery depends on contract options.

To install new CH700 Updates on the Handler Computer, insert the CH700 CD and follow instructions in the *Instructions.rtf* file.

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*NOTE: Your existing winAH400.ini will not be replaced so all your settings will remain the same.*

*NOTE: Updating TaskLink (FC) and Job Runner or Job Creator (LX) require different CDs than the CH700 updates. For more information, see the online Help for TaskLink or Job Runner or Job Creator.*

*NOTE: PSV5000 System algorithms are updated periodically and are available depending on your maintenance plan. For more information about **update kits** or the **support agreement plan** go to <http://www.dataio.com/Support/Software-Firmware>*

An **APS** is our  
Annual  
Programmer  
Support  
Agreement.

**Algorithms** are updated via TaskLink (FC) and Job Creator (LX). For more information see TaskLink Help or Job Creator Help. To search for specific device support visit our Device Search web page:  
[www.dataio.com/Support/Device-Support/Device-Search](http://www.dataio.com/Support/Device-Support/Device-Search)

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# Troubleshooting

This section contains solutions to problems that may arise during operation of the PSV5000.

Troubleshooting for the Tape Output System is covered in a separate heading; see *Tape Output System Maintenance* on page 140.

Also, see PSV5000 on-screen Help for a more detailed Troubleshooting chart.

## HEADINGS BELOW COVER THESE TOPICS:

Common Error Messages

Collect all PSV5000 System Logs on page 133

Programming Problems on page 133

Pick and Place Problems on page 137

Air Pressure Problems on page 138

Tray Feeder Problems on page 139

Handler Computer Failure on page 139

## Common Error Messages

Lamp Color	Error Messages	Possible Resolution
Red	<ul style="list-style-type: none"> <li>Cannot connect to the motion controller.</li> </ul>	<ul style="list-style-type: none"> <li>Check that both Emergency Stop buttons are OFF.</li> <li>Check that all safety doors are closed.</li> <li>Properly shut down the PSV5000 Machine if possible, and restart the system.</li> </ul>
Red	<ul style="list-style-type: none"> <li>E-STOP ACTIVATED but the OK button is grayed out (unavailable)</li> </ul>	<ul style="list-style-type: none"> <li>Check that both E-Stop buttons are released.</li> <li>Check that all safety doors are closed.</li> <li>If a restart is necessary, press Ctrl + Alt + Del on the keyboard</li> </ul>

<p>Yellow</p>	<ul style="list-style-type: none"> <li>• Tray not present</li> </ul>	<p>PSV5000 does not detect the tray and when you click Run, you get error message Tray Not Present; or the Run window shows a tray where there is none.</p> <ul style="list-style-type: none"> <li>• Re-install the tray.</li> <li>• At the Run window, the Tray Present Sensor should be ON.</li> <li>• If the tray is still not detected, remove the tray and place a finger over tray present sensor. <ul style="list-style-type: none"> <li>–If sensor is working, tray outline appears. Re-install tray.</li> <li>–If sensor is not working, the tray outline does not appear—contact Data I/O Customer Support or a local Data I/O approved service representative</li> </ul> </li> </ul>
<p>Red</p>	<ul style="list-style-type: none"> <li>• Z MOTION ERROR 800: LIMIT EXCEEDED ON AXIS 2</li> </ul>	<p>Conditions: A Red ERROR box appears in bottom right corner of the Monitor.</p> <p>Contact Data I/O Customer Support or a local Data I/O approved service representative.</p>
<p>Red/Yellow</p>	<ul style="list-style-type: none"> <li>• Error Tape Out</li> </ul>	<ul style="list-style-type: none"> <li>• If a device is jammed in the Tape Output System, clear it. Acknowledge the error message by pressing the ESC key. Then click OK on the PSV5000 Monitor.</li> <li>• If above doesn't work, call the Service Technician.</li> </ul>
<p>Red</p>	<ul style="list-style-type: none"> <li>• Main Air OFF</li> </ul>	<ul style="list-style-type: none"> <li>• Check that the main input air valve is in the ON position.</li> <li>• Check that the main air hose is connected.</li> <li>• Check that the air pressure is within the required range (green LED readout instead of red.)</li> <li>• Contact Data I/O Customer Support or a local Data I/O approved service representative.</li> </ul>
<p>Red</p>	<ul style="list-style-type: none"> <li>• Vacuum error</li> </ul>	<ul style="list-style-type: none"> <li>• See <i>Adjusting the Vacuum Generator Sensor</i> on page 105.</li> <li>• Contact Data I/O Customer Support or a local Data I/O approved service representative.</li> </ul>



## RESTARTING AFTER TROUBLE

If the CH700 Software closes, locks up, or experiences some trouble that qualifies as a crash, then the PSV5000 Machine power must be turned OFF for 20 seconds prior to restarting the software.

## Collect all PSV5000 System Logs

*Collect PS Logs* is a software utility on CH700 Software that collects all log files from PSV5000. It creates a ZIP file containing all the information that Data I/O or trained service technicians need to evaluate your PSV5000 Machine status.

## 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. (Note any dialogs with the Collect Logs button) and close CH700 the usual way as follows:
  - a. Click Finish to stop a job.
  - b. Exit the Run window.
  - c. Exit the System window.
  - d. Exit the Setup window.
3. Start Collect PS Logs. See heading Starting 'Collect PS Logs' below.

## OTHER PROBLEMS

For problems that are NOT programmer related, run the *Collect PS Logs* application any time after the problem has been seen.

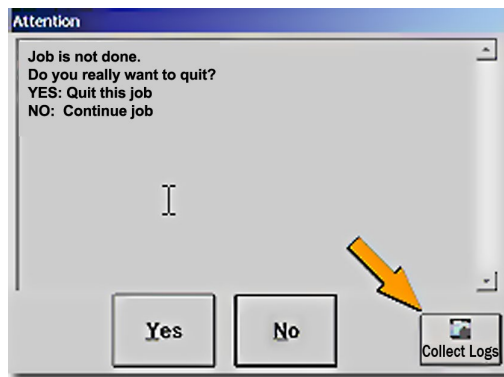
## STARTING 'COLLECT PS LOGS'

There are three methods to start the Collect PS Logs application.

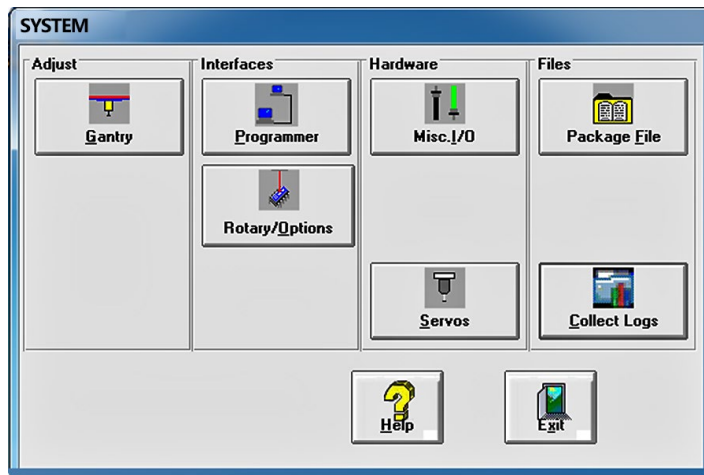
### **AUTO METHOD (THE APP ISN'T VISIBLE)**

**AUTO Method uses default settings**— The Auto Method itself has two ways to collect logs. The Collect Logs Application does not open with these auto methods.

- **FIRST AUTO METHOD:** The CH700 Software displays a button in each message box that allows you to start the Collect PS Logs application in AUTO Mode.



- SECOND AUTO METHOD: The CH700 Software also displays a button in the System window.



When starting Collect PS Logs in AUTO Mode, only a progress screen is shown on the lower left corner of the screen. All defaults are used and no user action is required. A log zip file named with the current date and time is saved in the Documents folder (C:\Documents, or C:\Libraries\Documents.)

**START APP METHOD IN WINDOWS OS**

The Start App (non-auto) method is the Windows method using the Windows Start menu; it offers some options. Click Window Start > All Programs > Data IO > Collect PS Logs.

After starting Collect PS Logs from the Start menu, the main window appears where you can select which items you need to collected.

1. Select or clear check boxes for files as desired.

2. (Optional) Check additional SPC files if the error rarely appears or appeared a long time ago.
3. (Optional) In Collect PSV5000 Logs, to enter a text description to the Zip file:
  - a. Click Add description.
  - b. Type a description into the field available. In addition to what you type, the description will include the Date and Time the log was captured and the serial number information from the winAH400.ini file.
4. Click Collect and ZIP.

A ZIP file is created and copied to the Windows Clipboard. A message advises pasting it into a folder you choose.

5. Click OK to the message about pasting the ZIP file to a desired folder.

For more information see the CH700 on-screen Help.

## Programming Problems

Lamp Color	Error Messages	Possible Resolution
None	<ul style="list-style-type: none"> <li>One programmer has many continuity failures (in Statistics window).</li> </ul>	<ul style="list-style-type: none"> <li>Move the Socket Adapter to another programmer to see if the problem is the programmer or the adapter, as follows:                             <ol style="list-style-type: none"> <li>If a job is running click Pause and wait until all programmer activity is done.</li> <li>Check that there are no devices in the target adapter. If there are, click Finish.</li> <li>Replace the target Socket Adapter with another empty adapter.</li> </ol> </li> </ul> <p>If the failure moves with the Socket Adapter, check for bent, damaged or worn pins on the sockets.</p> <p>If continuity failures persists in the same programmer, see <i>Pick and Place Problems</i> on page 137.</p> <hr style="border: 1px solid yellow;"/> <p><i>If a programmer is not performing and you cannot correct the error, you can continue to use other programmer sites after disabling the non-functional programmer. See <a href="#">Disabling Programmers in the PSV5000 Operators Manual</a> or the CH700 on-screen Help.</i></p> <hr style="border: 1px solid yellow;"/>
Red	<ul style="list-style-type: none"> <li>All programmers fail to program devices.</li> </ul>	<ul style="list-style-type: none"> <li>Check that the Programmer Simulation switch on the Setup window is <b>OFF</b>. If not, switch it to OFF.</li> <li>Check that the Programmers circuit switch on the Power Panel is On.</li> <li>Check the Log file for helpful information as follows:                             <ol style="list-style-type: none"> <li>Pause the job.</li> <li>Exit the Run window.</li> <li>At the Setup window click System &gt; Log File.</li> </ol> </li> </ul>

## Pick and Place Problems

Lamp Color	Error Messages	Possible Resolution
<ul style="list-style-type: none"> <li>Red/ Yellow</li> </ul>	<ul style="list-style-type: none"> <li>Devices are not being placed into sockets or output media accurately.</li> </ul>	<ul style="list-style-type: none"> <li>Check that the probe is not bent.</li> <li>Check all fasteners and connections on the head and gantry. Also see <i>Inspecting Gantry Parts</i> on page 110.</li> </ul>
<ul style="list-style-type: none"> <li>Yellow/ Red</li> </ul>	<ul style="list-style-type: none"> <li>The probe experiences pick and/or place errors regularly.</li> </ul>	<ul style="list-style-type: none"> <li>Contact Data I/O Customer Support or a local Data I/O approved service representative.</li> </ul>
<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>The probe is dropping devices.</li> </ul>	<ul style="list-style-type: none"> <li>Clean or replace the Probe Tip. See <i>Pick and Place Probe</i> on page 103</li> <li>Clean the vacuum filters. See <i>Vacuum Generator Filters</i> on page 108.</li> <li>Check the main input air pressure; refer to <i>Connecting Air</i> on page 34.</li> </ul>
<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>A probe attempts to pick a device twice even though it picked up the device the first time.</li> </ul>	<ul style="list-style-type: none"> <li>The Vacuum sensor may need calibrating. See <i>To Adjust Probe Vacuum Generator Sensors</i> on page 106.</li> <li>If programming TQFP 144, you can increase the value for 'suckup time' in the Package File to maximum value of 500 ms. See the Setup window &gt; System &gt; Package File. Refer to the on-screen Help.</li> </ul>
<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Devices are bouncing.</li> </ul>	<p>The socket air pressure may be too high.</p> <ul style="list-style-type: none"> <li>Reduce the socket actuation air pressure. See <i>Adjusting the Socket Actuator Air Pressure on the Programmers</i> on page 99.</li> </ul>
<ul style="list-style-type: none"> <li>Red/ Yellow</li> </ul>	<ul style="list-style-type: none"> <li>Pick or place errors at all programmers.</li> </ul>	<p>The socket is not opening completely—the air pressure might be set too low.</p> <ul style="list-style-type: none"> <li><i>Adjusting the Vacuum Generator Sensors</i> on page 105.</li> <li>Increase the socket actuation air pressure. See <i>Adjusting the Socket Actuator Air Pressure on the Programmers</i> on page 99.</li> </ul>

## Air Pressure Problems

Lamp Color	Error Messages	Possible Resolution
Red	<ul style="list-style-type: none"> <li>• There is no main air pressure.</li> </ul>	<ul style="list-style-type: none"> <li>• Make sure that the main air switch on the Power Panel is in the ON position.</li> <li>• Check that the air regulator on the Power Panel displays within the acceptable range: PSV5000 Specifications on page 1-9.</li> </ul> <p>If not:</p> <ul style="list-style-type: none"> <li>• Check your shop air pressure.</li> <li>• Shut down and replace the filter. See <i>Replacing the Input Air Pressure</i> on page 107.</li> </ul> <p>The digital display on the regulator will be green when air pressure is within the correct range and red when it is out of range. The regulator has been set at the factory and is not adjustable.</p>
Red	<ul style="list-style-type: none"> <li>• There is no (or low) vacuum on the PNP probe.</li> </ul>	<ul style="list-style-type: none"> <li>• Check that the probe is not loose and that the O-Ring is not destroyed or leaking. See <i>Pick and Place Probe</i> on page 103.</li> <li>• Determine if the PNP head probe is clogged. Clean if necessary. Refer to <i>Removing and Installing a Probe</i> in the PSV5000 Operator's Manual.</li> <li>• Check the probe vacuum and Blow-off solenoids; see <i>Adjusting the Vacuum Generator Sensors</i> on page 105.</li> <li>• Clean the vacuum generator filters and silencers; see <i>Vacuum Generator Filters and Silencers</i> on page 108.</li> </ul>

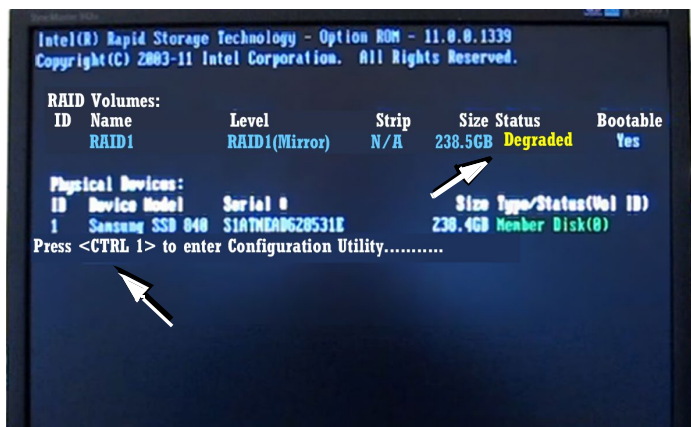
## Tray Feeder Problems

Lamp Color	Error Messages	Possible Resolution
Yellow	<ul style="list-style-type: none"> <li>The Run window indicates a tray is present on the Tray Feeder when there is no tray there, or vice versa.</li> </ul>	<ul style="list-style-type: none"> <li>Navigate to the System &gt; MISC I/O window and verify that the Tray Present Sensor = ON.</li> </ul>
None	<ul style="list-style-type: none"> <li>Probe miss-picks or misplaces devices at the trays.</li> <li>Probe hits devices in a tray hard at one end and not the other.</li> </ul>	<ul style="list-style-type: none"> <li>Check that the tray feeder is level. Adjust the outside mounting bar if necessary.</li> </ul>

## Handler Computer Failure

If the Handler computer drive fails, its behavior or a message indicates that a computer has crashed.

Your PSV5000 System is equipped with a mirror-backup system called RAID that creates a *real-time* ghost image. You will see an error message display for a few seconds at system start-up.

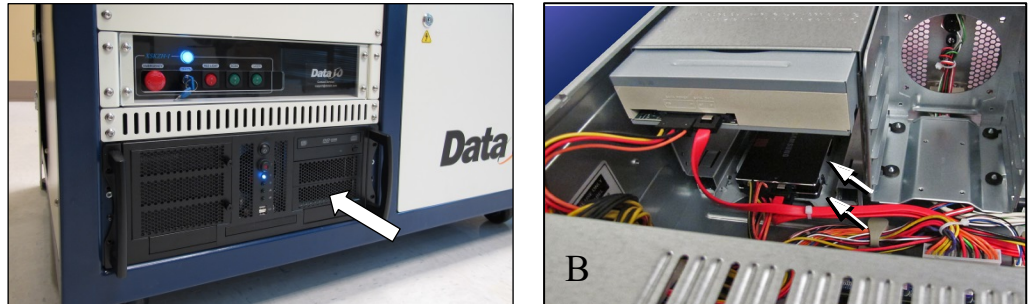


**Figure 80:** This message, **DEGRADED**, will display for about seven seconds at startup if a Handler drive has failed.

**Your PSV5000 System will continue to operate as normal on the backup drive. However, the failed drive must be replaced for continued safety.**

After the failed drive is identified and replaced, the message on-screen will read REBUILDING. After it has rebuilt, the next time you start up it will read NORMAL.

Contact Data I/O Support or your nearest Data I/O representative.



**Figure 81: The RAID solid state hard drives are inside the Handler PC case. The Handler PC must be removed to access the RAID backup drives. In image B, the Handler PC cover has been removed: this image is a representation only for reference.**

## Tape Output System Maintenance

The Tape Output System is an optional system for placing and taping programmed devices into device tape.

Items not covered here can be found in the *TM-50 Taping Module User's Guide* that came with your PSV5000 System.

### Cleaning the Pressure Seal

The Pressure Seal Tape Output System requires cleaning to prevent problems with breaking the device tape or tearing the tape sprocket holes. Cleaning removes build up from the cover tape application rollers and the drive sprocket top pressure idler wheel.

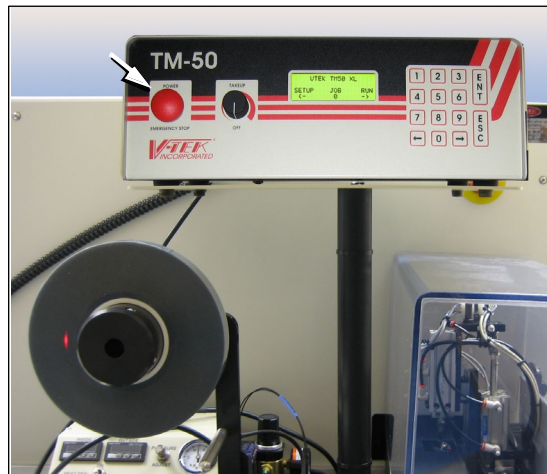
#### CLEANING TOOLS REQUIRED

- Dry or damp shop towel
- A reel of empty device tape (carrier tape)
- A reel of cover tape



To clean the Pressure Seal Tape Output System:

1. Turn ON the PSV5000 System power and air.
2. Start TaskLink.
3. Select a job that requires the use of the tape output.
4. Click Run (and Yes or OK to subsequent dialogs), which opens CH700 automatically.
5. Click Start.
6. Turn on the Tape Output Controller by pushing the red Power button. Refer to the figure below.
7. At the V-TEK start-up screen, select Setup by pressing the left arrow button.



**Figure 82: Tape Output Module Controller. The arrow points to the Power On/Off button which is also the Emergency-Stop (for the Tape-Out Module only!).**

8. Configure the Tape Output Controller by setting the following:

#### AT THE SETUP MENU:

- reset Count Stop to desired amount:  
Press 1, to re-zero the present count  
Press 2, then enter the desired number, then press the ENT button.
- select the desired device tape pitch from the Pitch Selection menu. Then press ENT.

---

*The pitch can be determined by using the pitch setting decal located on the loading track or the pitch setting guide found at the front of the TM-50 Taping Module User's Guide.*

---

#### AT THE ADVANCE MENU:

- set the number of pockets to advance to 1. Then press ENT.

#### AT THE SPEED MENU:

- set the advance speed between 40 to 100 depending on the device tape width and device size. Then press ENT.

---

*NOTE: Prevent device tape breakage and advancement problems with narrower tape widths by setting slower speeds— in range 40 to 60.*

*Higher speeds may cause the devices to be dislodged from the pockets or may cause the sprocket holes on the tape to rip out.*

---

#### AT THE JOG MENU

- jog the device tape forward to align the pocket with the PNP head.

#### AT THE MODE MENU

- select PSA mode for pressure seal cover tape. An asterisk indicates the current setting. Then press ESC.

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*NOTE: The Heat Seal switch should be OFF.*

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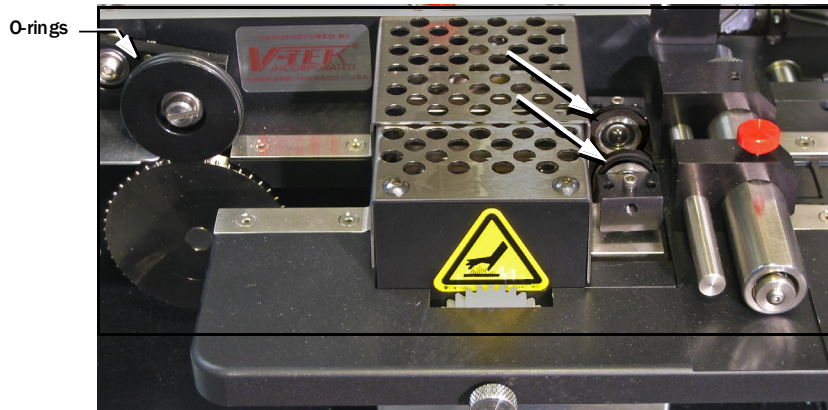
#### AT THE RUN MENU

- select Run Mode. The run window displays all the

selected setup parameters.

- verify all settings for accuracy.

9. Inspect the PSA seal rollers for build up of grime from the cover tape. See the figure below.



**Figure 83: On the Tape Out Module, the PSA Seal Rollers (arrows) and Sprocket Idler with O-Rings.**



**CAUTION:** Possible Machine Damage! Do not use solvents other than alcohol when cleaning the black polyurethane wheels.

10. If grime buildup exists on the PSA Seal rollers—
  - a. Using a shop towel and alcohol or alcohol wipes, clean the build up from the cover tape application rollers. Hold the alcohol cloth on the roller and rotate the roller 360°.
  - b. Repeat procedure for the other application roller.
11. Inspect the drive sprocket top idler and rubber O-Rings for any build up from the cover tape. See the figure above.
12. If grime buildup exists on the idler and O-Rings—



**CAUTION:** O-Rings might be easily damaged. Handle gently to avoid breaking them.

- a. Gently remove the two O-Rings from the drive sprocket idler.
- b. Using a damp cloth or a commercial wipe, remove all grime from O-Rings.

- c. Wipe the idler clean.
- d. Reinstall the dry O-Rings onto the idler.

## Adjusting Pressure of the PSA Seal Rollers

---

1. Advance the device tape with the cover tape through the Seal Rollers using the manual advance pedal. Advance enough pockets to correctly align the cover tape on the carrier tape.
2. Perform a *peel back* test by peeling the cover tape from the carrier tape. Notice how well the cover tape adheres to the device tape. Perform a *twist* test by giving the tape a slight twist. Notice if the cover tape detaches from the device tape.

If either test produces loose cover tape, increase the application roller pressure by screwing the PSA Seal pressure adjustment screw in (clockwise).

If both tests look acceptable, visually inspect the sealed device tape for adhesive that may have been squeezed out during application. If adhesive is visible, the Seal Roller pressure is too high. Decrease the application roller pressure by screwing the PSA Seal pressure adjustment screw out and retest.

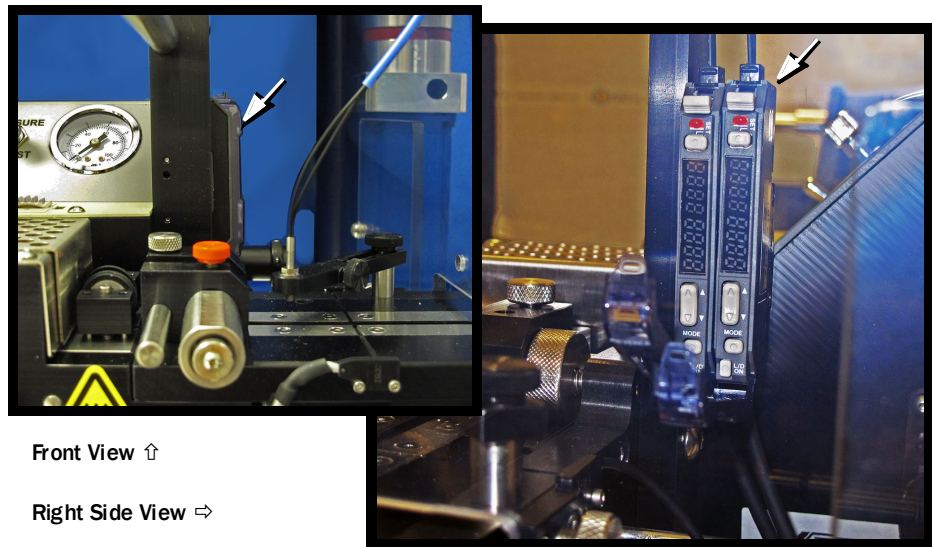
## Troubleshooting the Tape Output System

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The Tape Output System contains sensors that detect these fault conditions:

- a device is on top the device tape (carrier tape)—Track Jam Sensor
- no cover tape is on the reel—Cover Tape Sensor
- device tape is not properly inserted in the device tape track—Device Tape Present Sensor
- a pocket in the carrier tape is empty—Pocket Empty Sensor

When the CH700 software displays the error message Tape Out Unit, one of the tape output system sensors has been triggered. The most likely sensors to trigger are the Device Jam and Device Tape sensors. See figure below.



**Figure 84: Optical Fiber Amplifiers: Cover Tape Present and Empty Pocket, respectively. Amplifier doors are open in the right side view.**

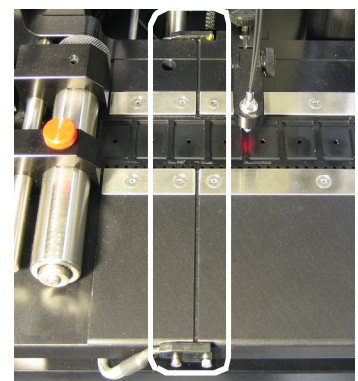
Lamp Color	Error Messages	Possible Resolution
None	<p><b>TRACK JAM SENSOR</b> Tape Out Unit error message displays and a red LED lights in the Device Jam Sensor.</p>	<ul style="list-style-type: none"> <li>• Use a vacuum tool to seat the device in the device tape pocket.</li> <li>• Re-seat the device tape in the Adjustable Loading Track.</li> <li>• Use air to blow any debris out of the Device Jam sensor path.</li> <li>• Adjust the Device Jam Sensor Controller. See <i>Track Jam Sensor and Controller</i> on page 146.</li> </ul>
None	<p><b>COVER TAPE SENSOR AND AMPLIFIER</b> Error message on the Tape Out Unit displays and a red LED is illuminated in the Cover Tape Sensor amplifier (left amplifier).</p>	<ul style="list-style-type: none"> <li>• Replace the empty cover tape reel with a full one.</li> <li>• If the reel still contains cover tape, adjust the Cover Tape Sensor Controller. See <i>Track Jam Sensor and Controller</i> on page 146.</li> </ul>
None	<p><b>POCKET EMPTY SENSOR AND AMPLIFIER</b> A Tape Out Unit error message displays and a red LED is illuminated on the Pocket Empty Sensor amplifier.</p>	<ul style="list-style-type: none"> <li>• Adjust the pocket-Empty Sensor. See <i>“Adjust the Pocket-Empty Sensor as follows:”</i> on the next page</li> </ul>

**TRACK JAM SENSOR AND CONTROLLER**

The Track Jam sensor detects when a device is not properly seated in the pocket. This sensor is located on the Adjustable Loading Track immediately before the carrier tape enters the cover taping area.

**COVER TAPE SENSOR AND AMPLIFIER**

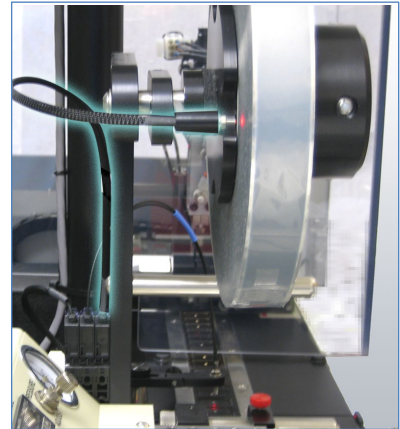
The Cover Tape sensor detects when there is no cover tape on the reel. When the Cover Tape sensor is triggered, a red LED is illuminated in the Cover Tape Sensor Controller.



The Track Jam sensor

### ADJUSTING THE COVER TAPE SENSOR CONTROLLER

1. Ensure that the Output Selector mode is set to D.ON by pressing the Mode button. (There may be an L/D ON button or toggle to change the mode.)
2. Install a roll of cover tape onto the spindle.
3. Press and release the SET button in the left amplifier.
4. Remove the cover tape.
5. Press and release the SET button again.



---

*NOTE: If an error occurs or the sensor fails to detect the cover tape after switching from a different type of cover tape, then the Cover Tape sensor may need to be re-taught to sense that particular type of cover tape.*

---

### POCKET EMPTY SENSOR AND AMPLIFIER

The Pocket Empty sensor alerts the operator when a pocket is empty as the device tape approaches the cover taping location.

#### ADJUST THE POCKET-EMPTY SENSOR AS FOLLOWS:

1. Set the track width for the target device tape
  - A) loosen the two Track Width Lock knobs,
  - B) pull or push the side nearest the operator to correct width,
  - C) tighten lock knobs.
2. Load a roll of device tape onto the spindle and into the track.
3. Loosen the knob on the left side of the Pocket Empty Sensor bracket to adjust the height above the tape. Retighten.
4. Loosen the knob on top to center the sensor on the tape. Retighten.
5. Advance the tape until a pocket with a device in it is centered under the sensor.
6. Ensure that the Output Selector mode on the middle amplifier is set to D.ON by pressing the Mode button. (There may be an L/D ON button or toggle to change the mode.)
7. Press and release the SET button in the right amplifier.
8. Remove the device from the tape pocket.

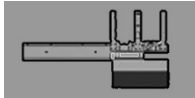
9. Press and release the SET button again.

---

*NOTE: The **Pocket-Empty Sensor** must be reset for each new device type to be taped.*

---

## The Tray Feeder



The Automatic Tray Feeder is optional equipment to the PSV5000 System. It is a high-speed tray exchanger, delivering JEDEC trays to pick and place positions.

Information not found here, but important, can be found in the Tray Feeder Operation Manual, such as the location of possible pinch points.

### Cleaning and Inspecting the Tray Feeder

#### [Tray Feeder only]

1. Stop or Pause a job if one is running.
2. Check the automatic Tray Feeder for damaged or broken parts and replace as necessary.
3. Visually inspect the shuttle belts for dirt, nicks, or other signs of damage.
4. If the shuttle belts are dirty, clean with dry, compressed air and wipe with a dry, lint-free cloth and isopropyl alcohol.
5. Check that the shuttle/elevator is clean and that trays lay flat.

## Electrical Equipment Disposal Notice



For customers in the European Union, this symbol displayed on your Data I/O product indicates that the item must NOT be discarded with general municipal waste. Either return products displaying this symbol to Data I/O so that they may be recycled or reused, or otherwise properly disposed of according to the European Union's WEEE Directive. You may also dispose of it yourself in accordance with the European Union's WEEE Directive.

Data I/O will collect this equipment at no cost to the equipment owner and process it accordingly. (This includes auxiliary equipment that came with your PSV5000 System such as Tape-Out Module, and Tray Feeder.)



- Electrical Equipment Disposal Notice  Cleaning and Inspecting the Tray Feeder

Contact your nearest Data I/O office to receive information about returning WEEE labeled products with no charge.

# Maintenance Sign-off Chart

PSV5000 SN \_\_\_\_\_

For maintenance instructions see  
*Maintenance Schedule* on page 92.

Copy this chart to  
use near your  
PSV5000 Machine

Enter name of people responsible or daily check marks:

**Daily**

Blow off  
sockets

Check input  
air

Name	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>Sunday</b>						

Enter initials and date:

**Weekly**

Run  
programmer  
Self-test, (cycle  
power)

Clean surfaces  
Clean probe  
tips.

Check Tray  
Feeder\*

Jan.	Feb.	Mar.	Apr.	May.	Jun.
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Jan.	Feb.	Mar.	Apr.	May.	Jun.
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Enter initials and date:

**Monthly**  
 Clean/inspect Tray Feeder\*  
 Check input air filter; drain fluid  
 Check vacuum generator filters

Jan.	Feb.	Mar.	Apr.	May.	Jun.
Jul.	Aug.	Sep.	Oct.	Nov.	Dec.

Enter initials and date:

**Quarterly**  
 Check vision  
 Clean safety doors  
 Clean the monitor  
 Replace probe O-Ring

Q1	Q2	Q3	Q4

Enter initials and date:

**Semi-Annually**  
 Check PNP head connections & fasteners  
 Clean Handler PC filter

Q1-Q2	Q3-Q4

Enter initials and date:

**Annually**  
 Clean and lube Gantry guide rails  
 Perform Programmer Performance Verification test  
 Check vacuum generator silencers on head

20__

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# ELECTRICAL SCHEMATICS FOR PSV5000 AND EQUIPMENT



# PSV3000/5000

# ELECTRICAL SCHEMATIC

## Schematic Pages: (Base Machine)

	Off-Sheet Name
	Prefix
Utility Panel	UP
Frame	FR
E-Plate 2	EP2
E-Plate 2 IO	EP2-IO
E-Plate 2 EStop SR	EP2-ESTOPSR
E-Plate 2 Door SR	EP2-DOORSR
E-Plate 1	EP1
End Effector	EE

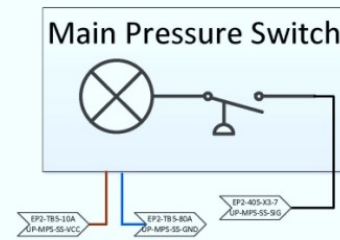
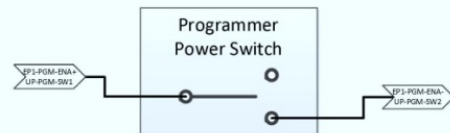
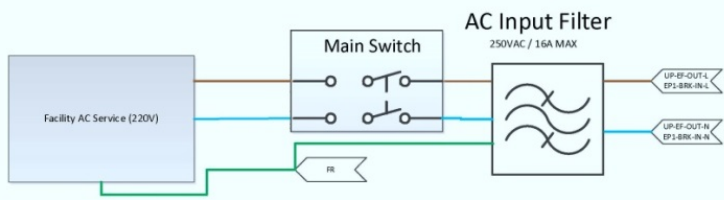
**Notes:**

\*IF YOU FOUND SOMETHING NOT MATCH THE MACHINE PLEASE CONTACT DATA I/O FOR CONFIRMING BEFORE YOUR OPERATING.

Document P/N: 30-8500322.1

Last Update: Feb/11/2016

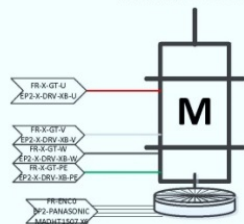
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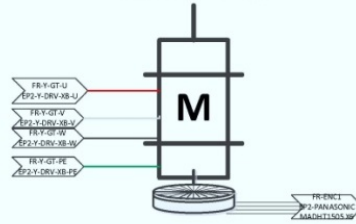
Utility Input Panel  
750-2493

## Utility Panel

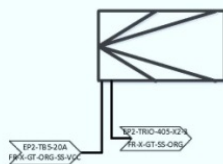
AC Gantry Servo  
Motor 0 X AXIS



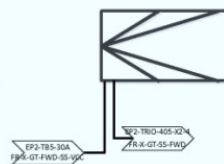
AC Gantry Servo  
Motor 1 Y AXIS



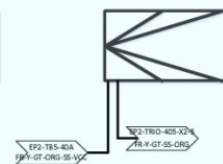
X AXIS ORG Sensor



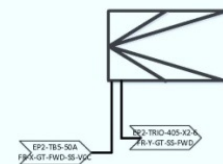
X AXIS FWD Sensor



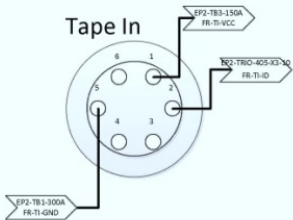
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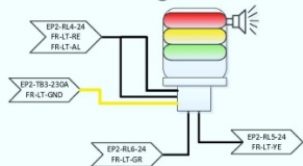
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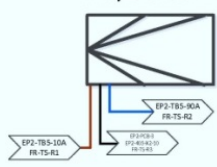
Tape In



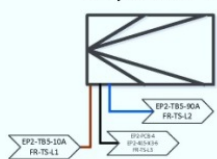
Light Tower



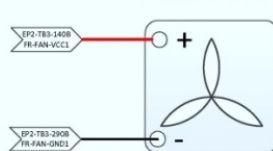
Tray Sensor 1



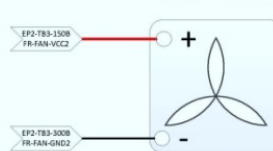
Tray Sensor 2



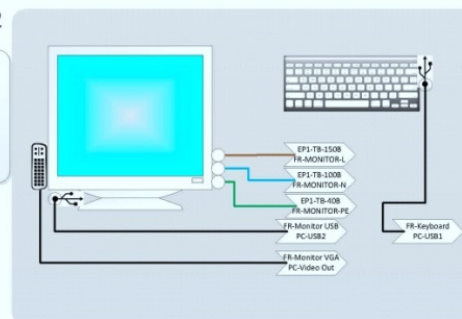
Chassis Fan 1

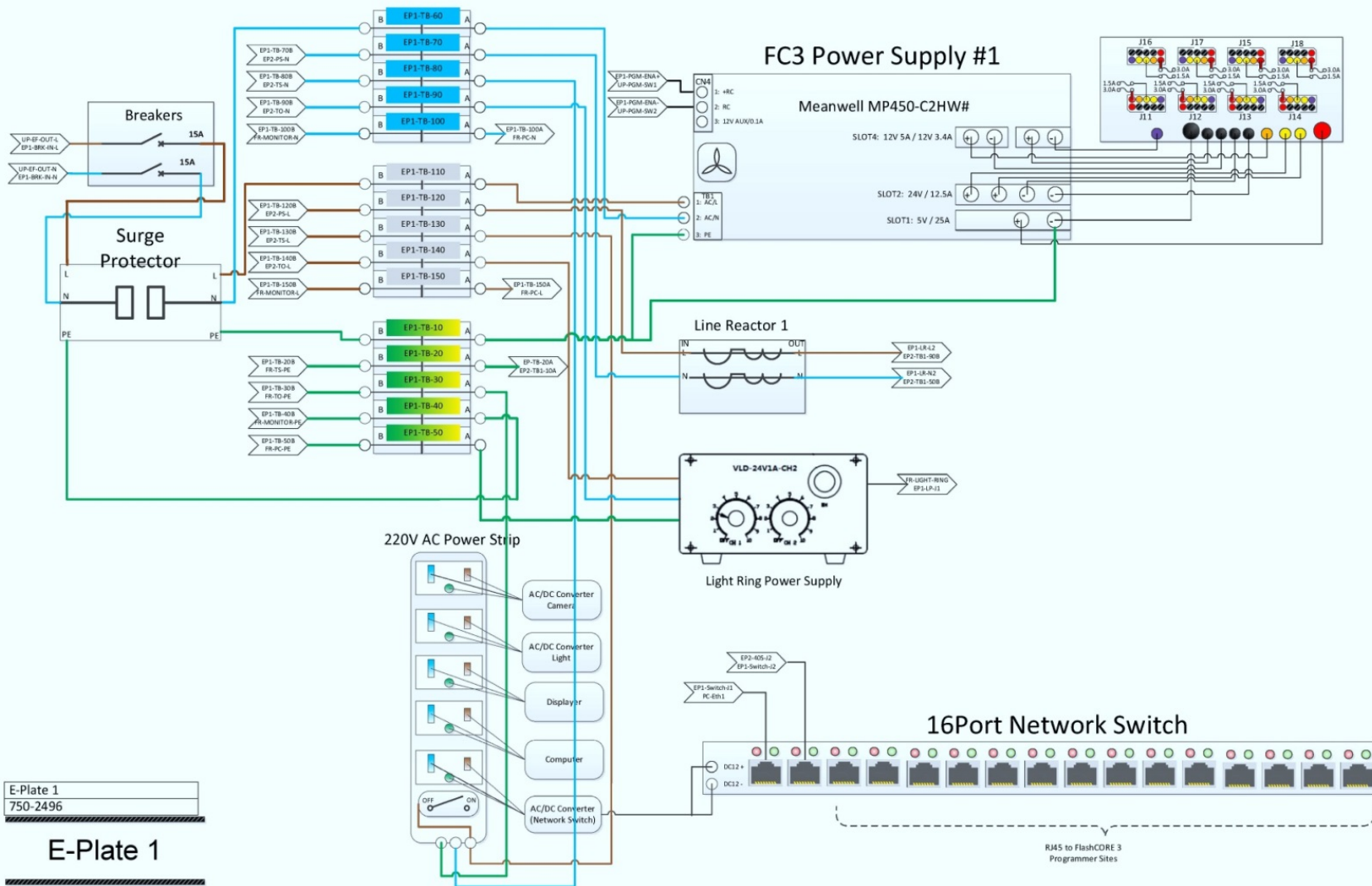


Chassis Fan 2



Frame

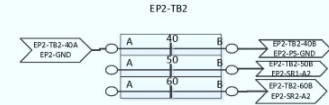
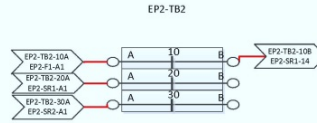
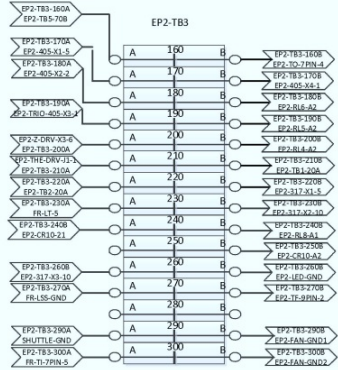
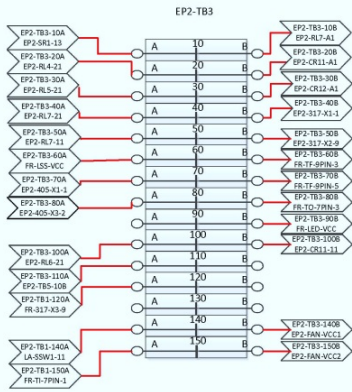




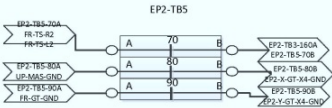
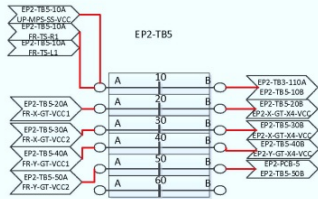
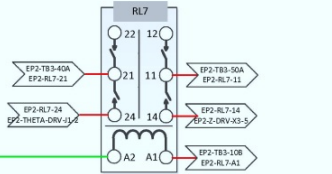
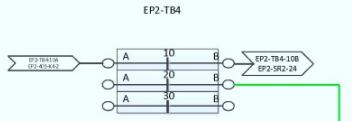
E-Plate 1  
750-2496

E-Plate 1

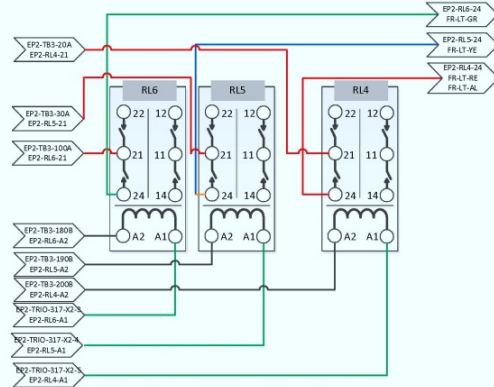


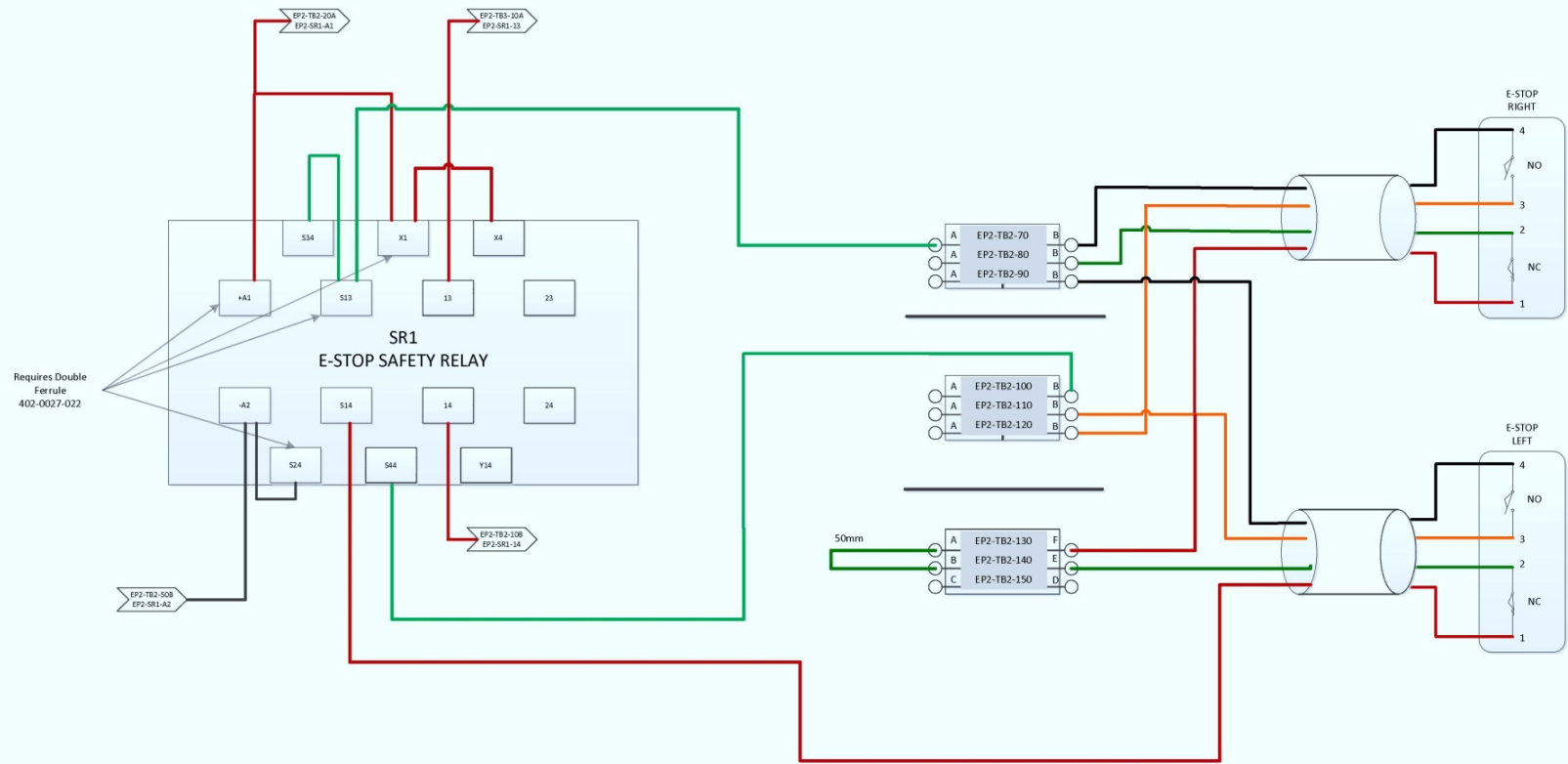


**Z THETA PWR RL7**



**LIGHT TOWER**

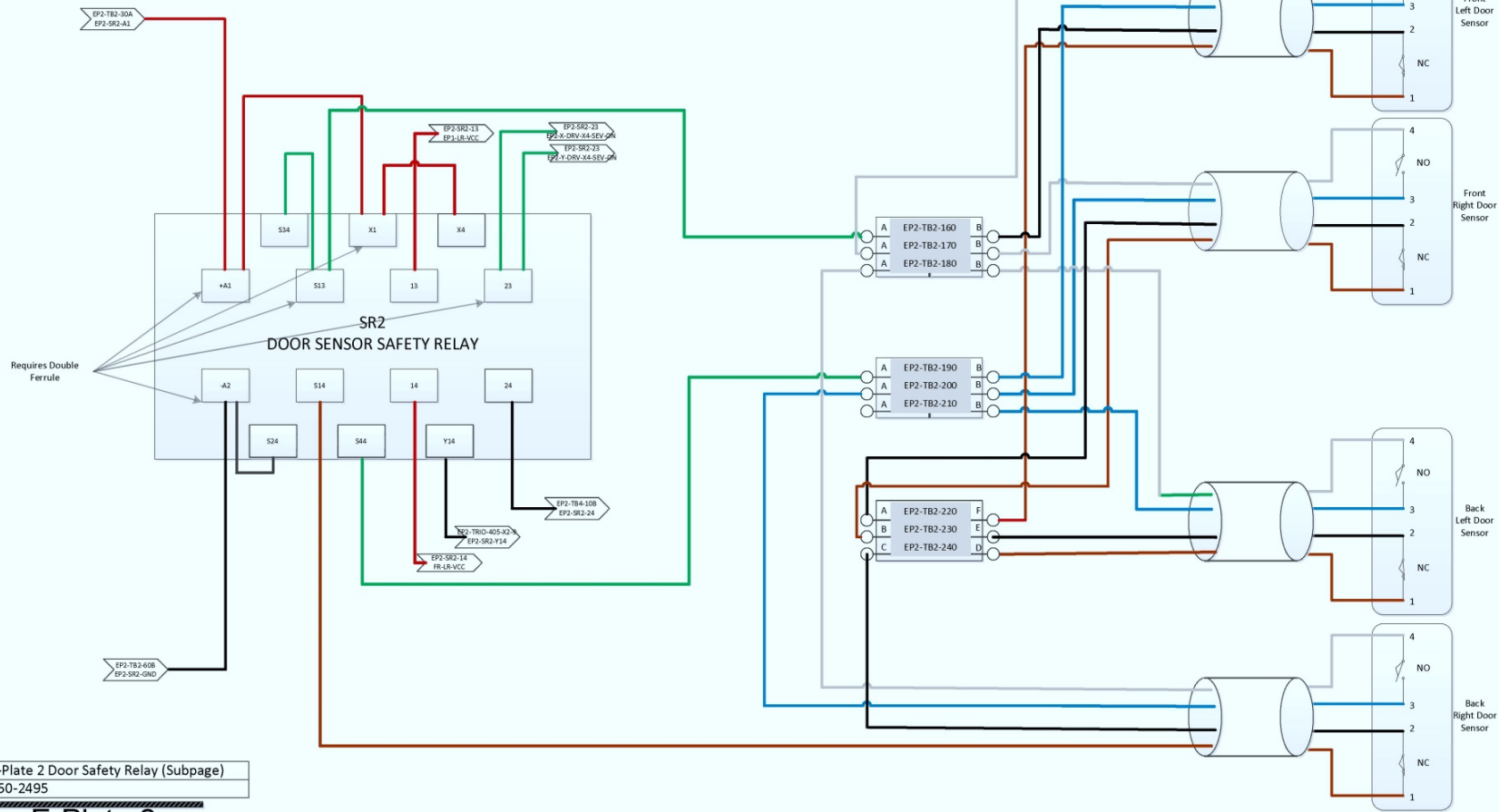




E-Plate 2 ESTOP Safety Relay (Subpage)  
750-2495

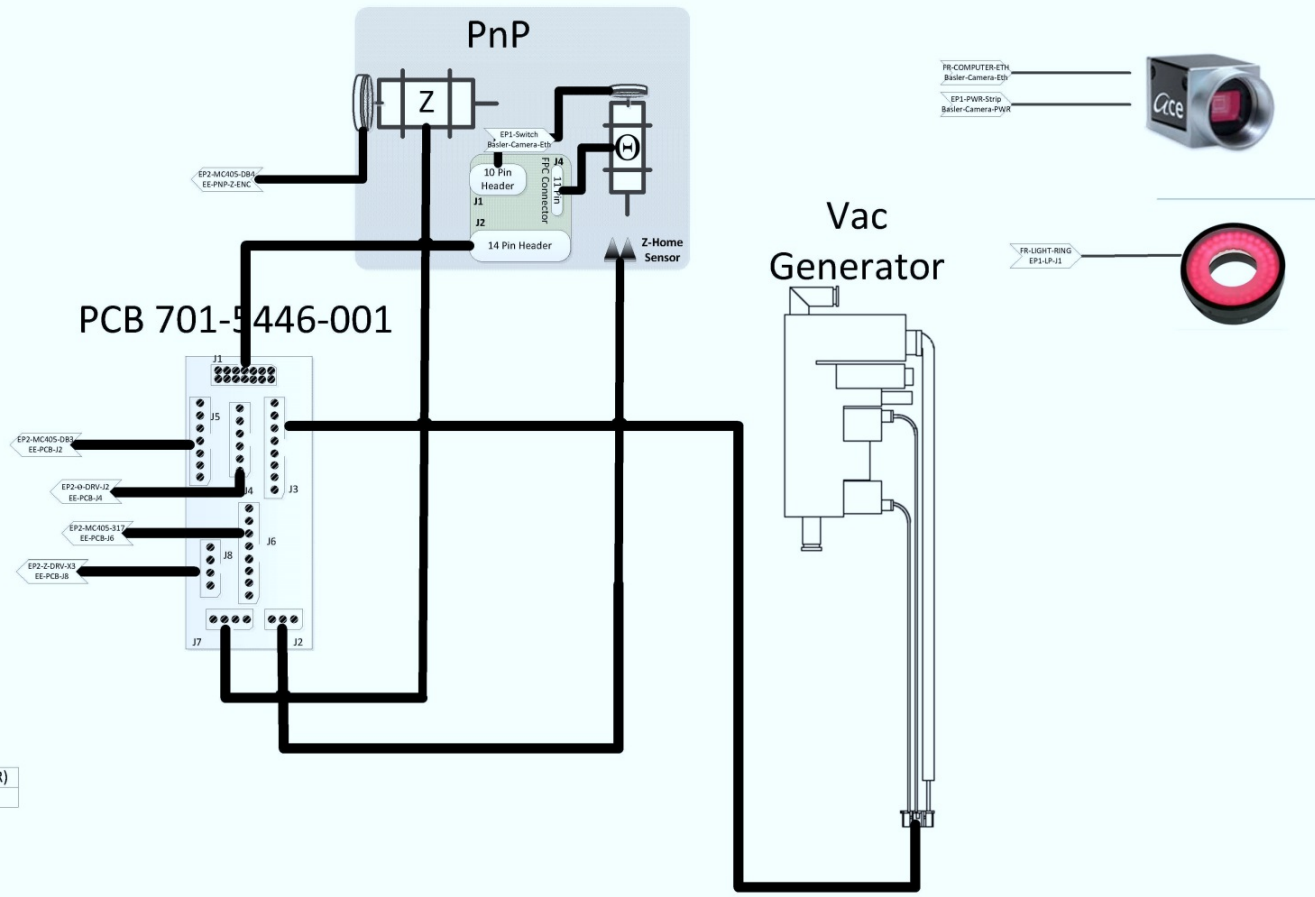
## E-Plate 2 ESTOP SR





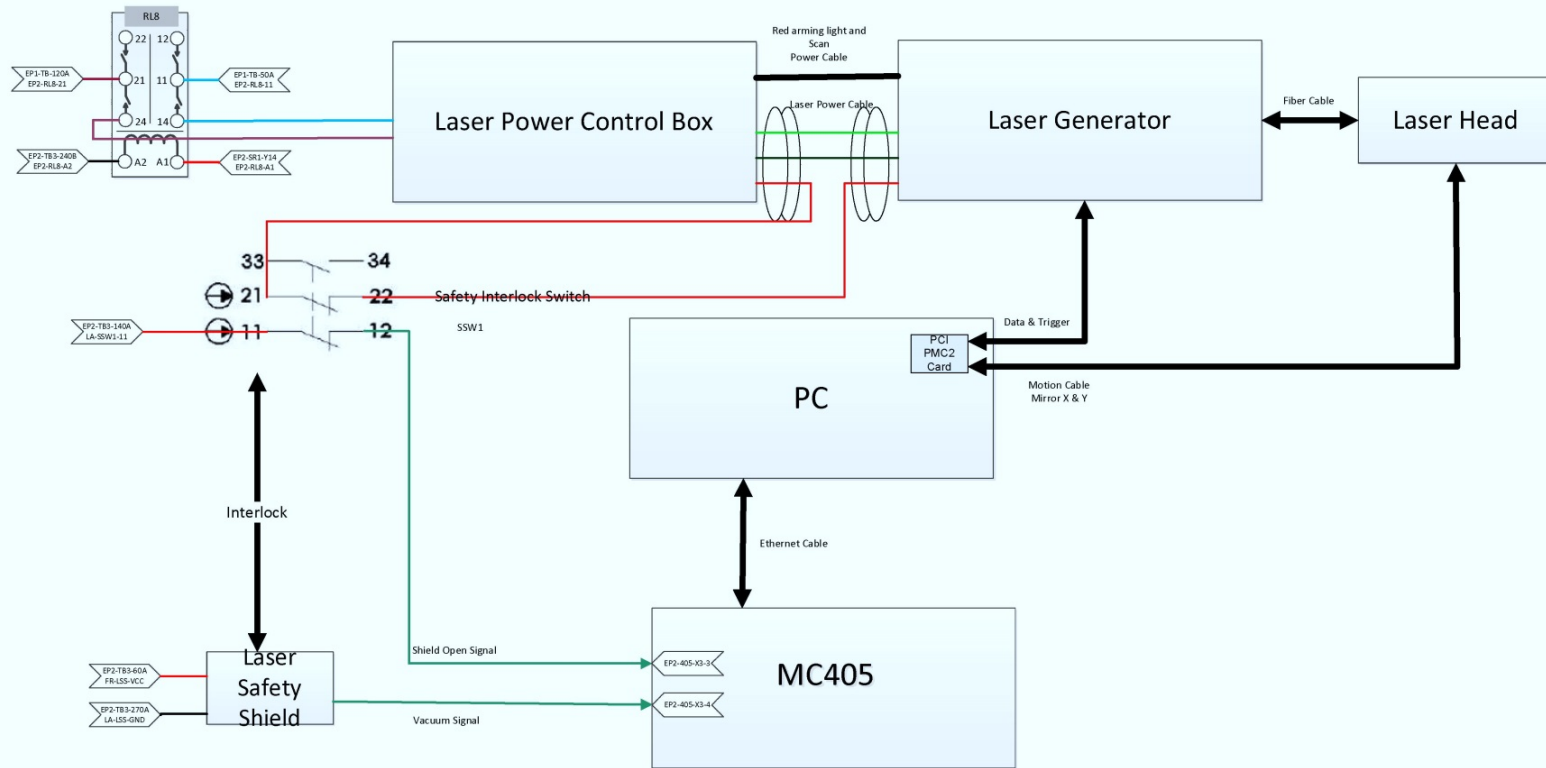
E-Plate 2 Door Safety Relay (Subpage)  
750-2495

## E-Plate 2 DOOR SR



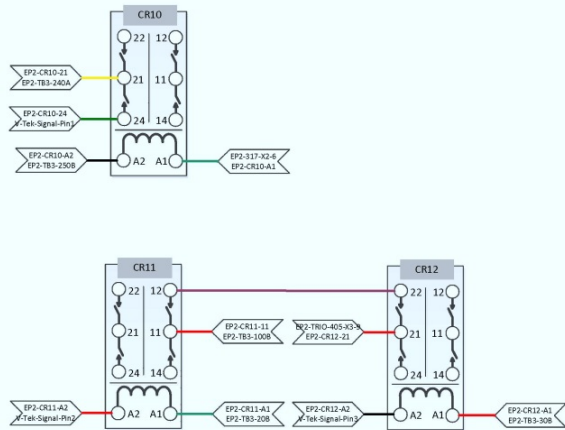
End Effector(PNP & VAC GENERATOR)  
750-2498 & 815-0047

**End Effector**



FIBER LASER MARKER SYSTEM  
966-0136

Laser

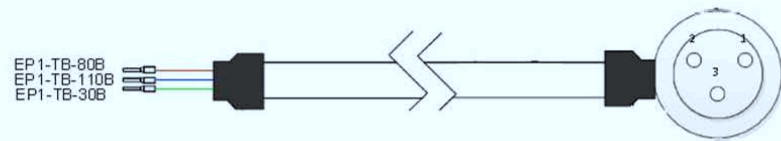


Note:  
Only TM50 Tape out need these 3 relays.

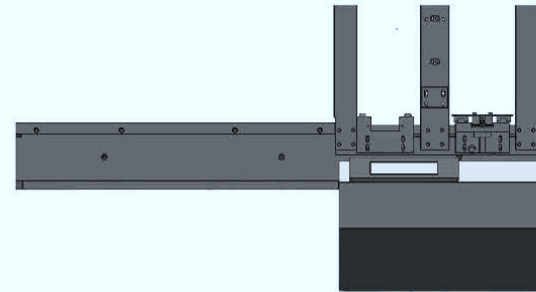
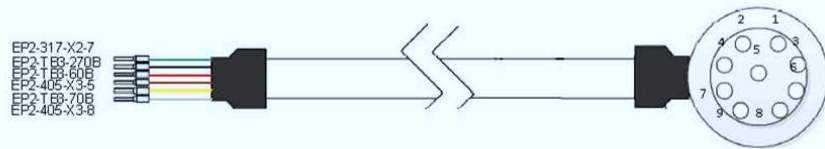
PSV5000-VTEK TAPE OUT SYSTEM
966-0137

VTEK TAPE OUT

POWER CABLE



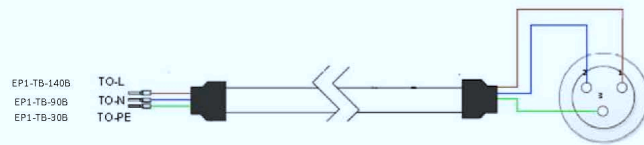
I/O CABLE



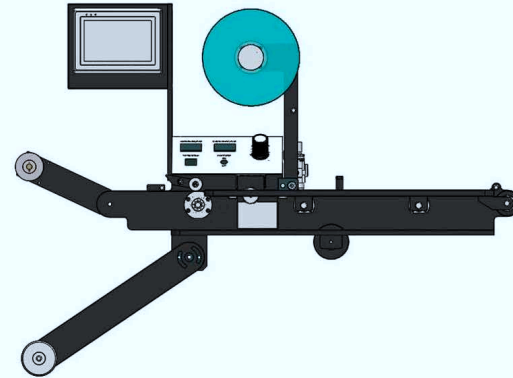
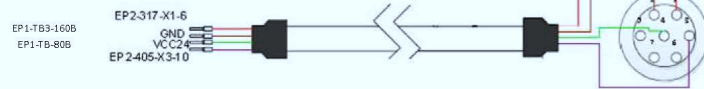
PSV3/5000-TRAY FEEDER SYSTEM  
966-0135

**TRAY FEEDER**

POWER CABLE



I/O CABLE



THIS PAGE ONLY FOR ANDLY TAPE OUT

PSV3/5000-TAPE OUT SYSTEM
966-0134

ANDLY TAPE OUT

Number	I/O TYPE	Function
0	I	X Axis ORG sensor
1	I	X Axis FWD sensor
2	I	Y Axis ORG sensor
3	I	Y Axis FWD sensor
4	I	Z Axis home sensor
5	I	Vac sensor
6	I	Door open sensor
7	I	Static tray sensor
8	I	Laser Cover Sensor
9	I	Laser Vacuum Sensor
10	I	Tray Stacker RD
11	I	Static Tray sensor
12	I	Main Air
13	I	Tray Stacker ERR
14	I	Tape Out RD
15	O	Tape in Index
16	O	Vac output
17	O	Puf output
18	O	Green Light
19	O	Yellow Light
20	O	Red Light & Beep
21	O	Tape out Index
22	O	Tray stacker Index
23	O	N.A
24	O	Laser shuttle position
25	O	#1 shuttle tip vacuum
26	O	#2 shuttle tip vacuum
27	O	N.A
28	O	N.A
29	O	N.A
30	O	N.A
31	O	N.A

PROGRAMMABLE MEDIA EXPERTS



**Data iO**