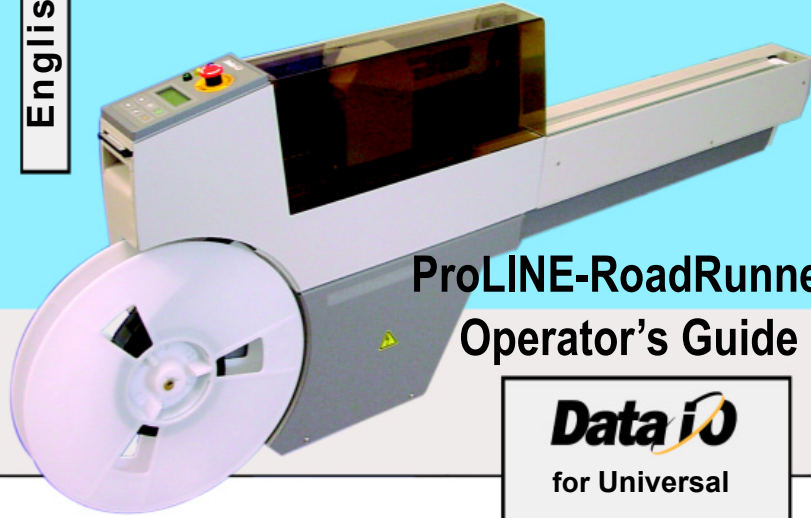


PN 096-0234-001A

English



ProLINE-RoadRunner™ Operator's Guide

Data iO
for Universal

Overview

Installation

Job Setup

Operation

Maintenance

Troubleshooting

Data I/O has made every attempt to ensure that the information in this document is accurate and complete. Data I/O assumes no liability for errors, or for any incidental, consequential, indirect, or special damages, including, without limitation, loss of use, loss or alteration of data, delays, or lost profits or savings, arising from the use of this document or the product which it accompanies.

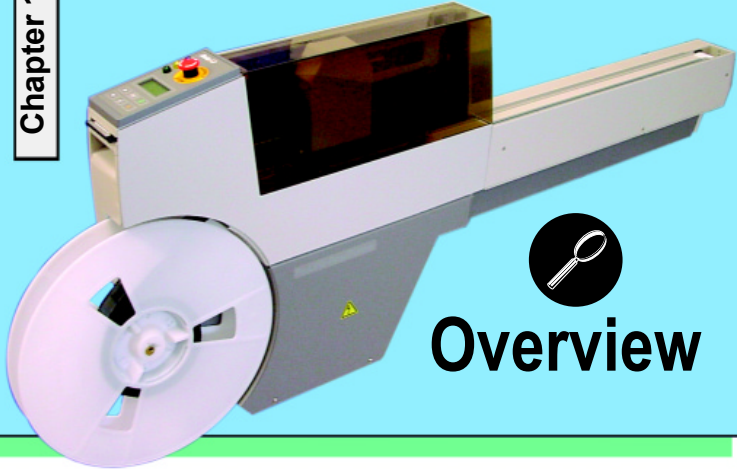
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Chapter 1



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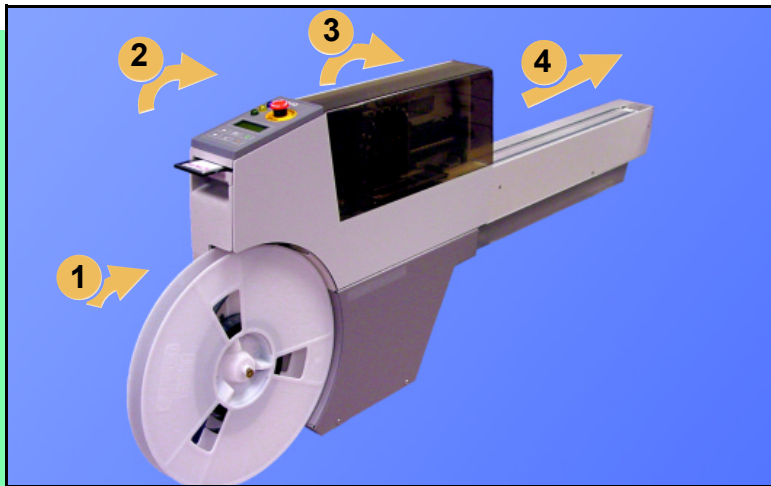
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The ProLINE-RoadRunner for Universal



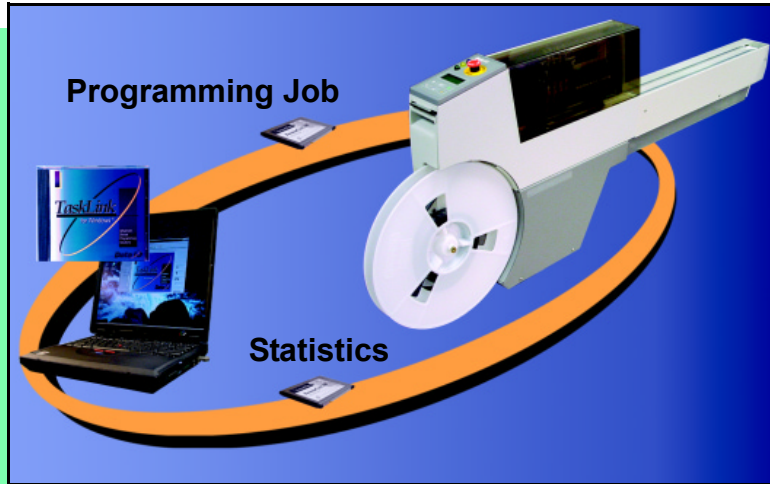
Data I/O is proud to introduce a revolutionary new inline solution for high-volume programming of FLASH memory devices.

The ProLINE-RoadRunner:

1. Takes programmable devices from a reel...
2. Places them in sockets and programs them with your data...
3. Places them on a conveyor belt...
4. Delivers them to the pick point of your placement machine. ■



Jobs and Statistics



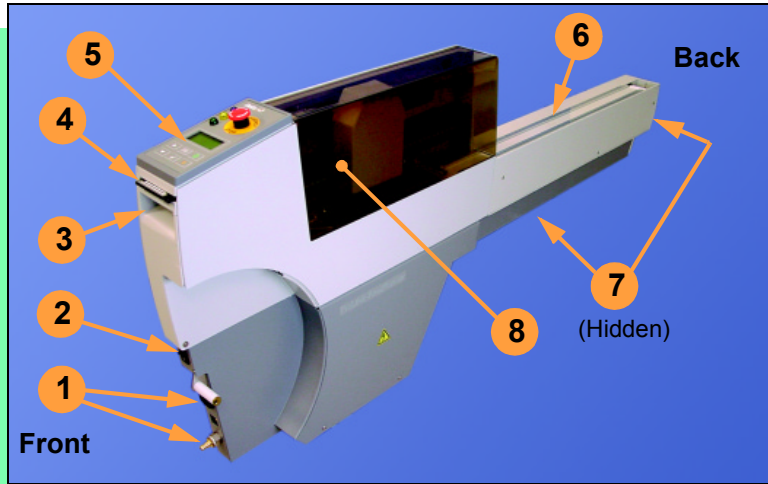
TaskLink™ for Windows® is required to process devices on the ProLINE-RoadRunner.

TaskLink allows you to create and manage a job database and it analyzes job statistics.

PCMCIA cards are used to transfer jobs and statistics between TaskLink and the RoadRunner.

For more information on TaskLink, see the TaskLink for Windows Help Menu. ■

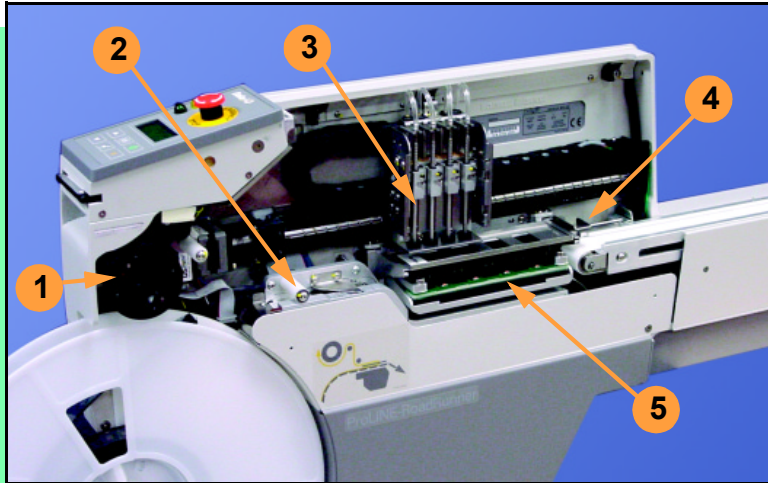
External View



1. Power and Air Connections
2. Power Switch
3. Handhold for lifting
4. PCMCIA Card Slot and Eject Card Button
5. Control Panel
6. Conveyor Belt with Dust Cover
7. Mechanical Interface to the Feeder Bank
8. Robotics Cover ■

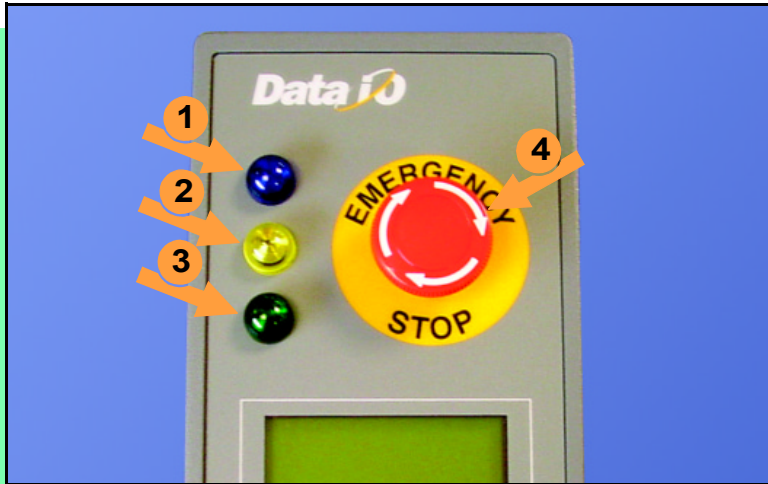


Internal Components



1. Cover Tape Take-Up Reel
2. Tape Advance Module
3. PNP Probes and Precisor
(PNP Head Cover not shown)
4. Reject Bin
5. Socket Adapter, Actuator Plate,
and Programmer ■

Control Panel Lights



1. **Blue** - Stop Indicator.
User intervention is required, or the unit is paused.

Do not remove PCMCIA card unless blue lamp is lit.

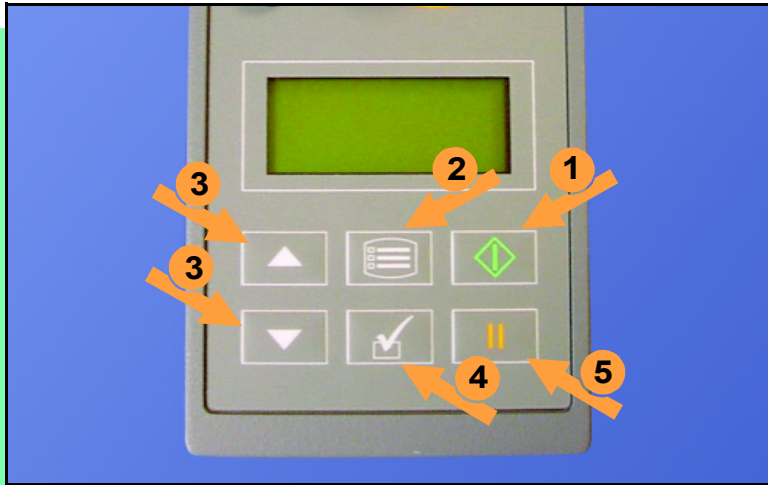
2. **Yellow** - Caution Indicator.
Correct a problem soon or the machine will stop.

3. **Green** - Run Indicator.
Lit: A job is running.
Blinking: Programmed devices are not yet at the pick point.

4. **Emergency Stop** - Press to stop the robot motors in an emergency. To resume motion, twist the button and press **Start**. ■



Control Panel Buttons



1. **Start** - Start or resume the chosen job.
2. **Menu** - Exit to the previous menu —or Show the next message (deleting the current one) —or Deselect an item.
3. **Up and Down Arrows** - Move through menu items.
4. **Select** - Select menu items.
5. **Pause** - Interrupt the job without cancelling it. ■

Operator Menus

JOB	
VIEW	Name: JOB U8 REVA ID27 Device: 28F010 Checksum: A6731C05 Adapter: 4070011003 Prec: 6210086002 Act: 6440016001
RESULTS	Devices: 5000 Rejected: 4 Job Yield: 99.9 Parts/Hour: 724 Down time: 0 Available: MCBI: Skt1 Yield: 99.9 Skt2 Yield: 100 Skt3 Yield: 100 Skt4 Yield: 100 Skt Cycles: 2500 Belt Empty #: 2
END	

ADVANCE POCKET

ALIGN POCKET

PURGE

SOCKET

Socket 1: Disabled
Socket 2: Enabled
Socket 3: Enabled
Socket 4: Enabled

Operator Menus are visible on the RoadRunner control panel, and can be navigated by using the **Up Arrow** and **Down Arrow** buttons.

If lost in the menu, press the **Menu** button. The **Menu** button will eventually return to the top level menu (**Job** is the first item in the top level menu).

NOTE: To change languages press **Menu** while pressing the **Select** button. **Arrow Down** to the desired language and press **Menu** twice. ■



Supervisor Menus



JOB	
SELECT	Job 1 Job 2 Job 3
HOME	
Performs the homing operation.	
OPERATION	
JOB	Pick Retries: 2 Pocket Pitch: 4
HEAD	Velocity: 250 Accel: 700
PROBES	Puff: 100 Pick: 200 Place: 100 Travel: 250
TEACH	Tape: 40 Skt 1: -26 Reject: -166 Belt: -180

SYSTEM	
TIME	Hour: 23 Minute: 59 Month: 06 Day: 21 Year: 2001
ODOMETER	Hours: 9999 Devices: 9999
UPDATE SOFTWARE	
MACHINE ID	E_Addr
ROBOT DIABNOSTICS	
Displays the Robot Diagnostics	
PROGRAMMER DIAGS	
Displays the Programmer Diagnostics	
EVENT LOG	
Displays the event history	

View the Supervisor Menus by inserting a PCMCIA card with supervisor authority.
(The menus, left, are in addition to the Operator Menus.)

For more information on supervisor authorization, refer to the TaskLink Help Menu, or the “ProLINE-RoadRunner Owner’s Manual.” ■

Warnings and Cautions



Compressed Air

Point air hoses away from body. Always wear approved eye protection.



Loud Noise

Sound pressure levels can exceed 85db. Hearing protection is recommended for prolonged exposure at this level.



High Voltage

Turn power off before removing electronics cover.



Heavy Object

This equipment weighs approximately 38 lbs (17Kg). Do not drop. Mount only on appropriate feeder banks.



Moving Parts

Pinch warning. Keep hands away from moving parts.

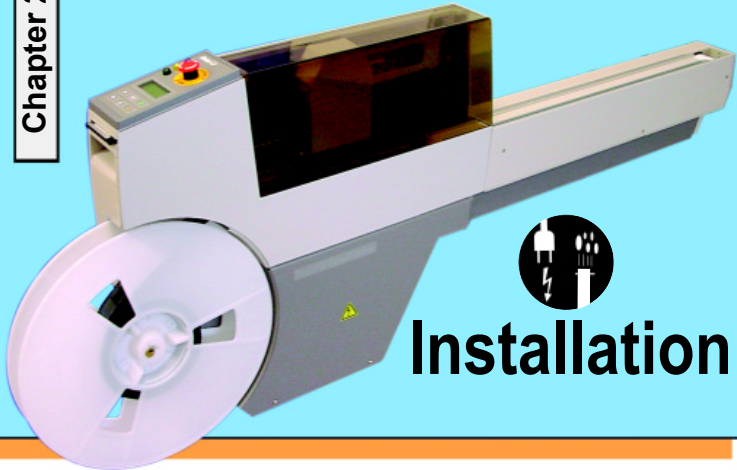


Electrostatic Discharge

Electrostatic Discharge (ESD) may cause damage. Discharge static electricity to a common ground.



Chapter 2



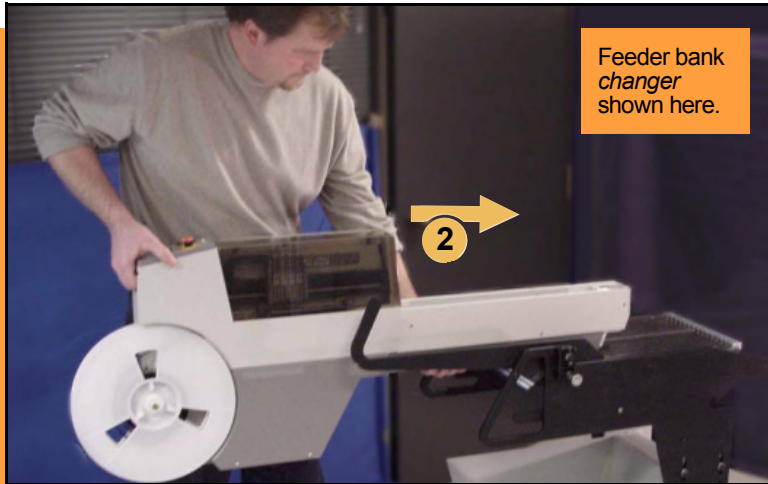
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Mounting onto a Feeder Bank



To mount the ProLINE-RoadRunner onto a feeder bank:

1. While holding the RoadRunner at a slight nose-down angle, let the nose rest on the bank. Ensure that the guide under the conveyor settles into a slot.
2. Level the RoadRunner while continuing to support the weight, and slide it forward as far as it will go.

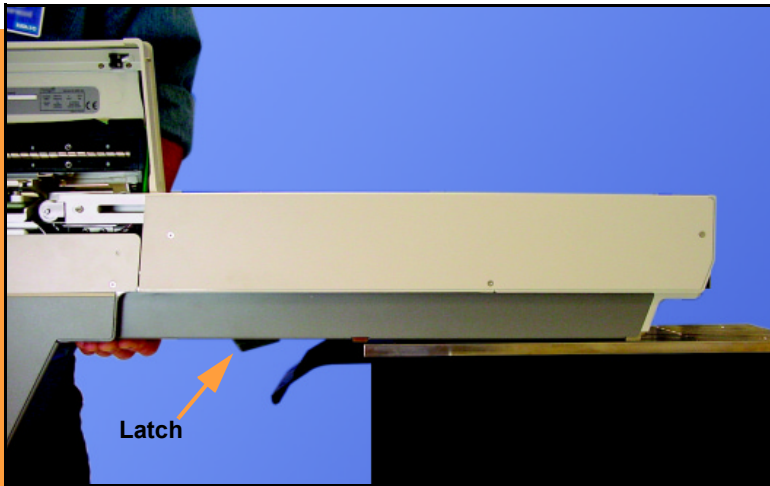


Warning



Heavy. 17 kg. Do not drop.
Mount only on approved units.





The communication path will connect automatically with spring pins.

3. Lower the RoadRunner. Its own weight will cause it to latch to the feeder bank.

NOTE: The RoadRunner may also be installed onto Feeder Carts.

To remove the RoadRunner, turn it off, lift it up enough for the latch to release and slide it back off the feeder bank. ■



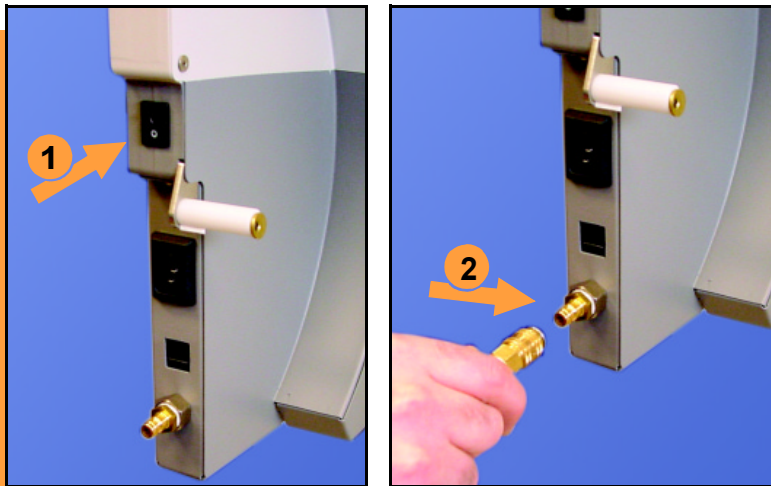
Warning



Heavy. 17 kg. Do not drop. Turn off the RoadRunner and disconnect facilities before removing it from a feeder bank.



Connecting Power and Air



To connect power and air:

1. Turn the RoadRunner power switch to the Off (0) position.
2. Grasp the air hose *behind* the “quick connect” collar and push it firmly onto the male fitting. The collar must be allowed to move back as the hose end goes onto the fitting.

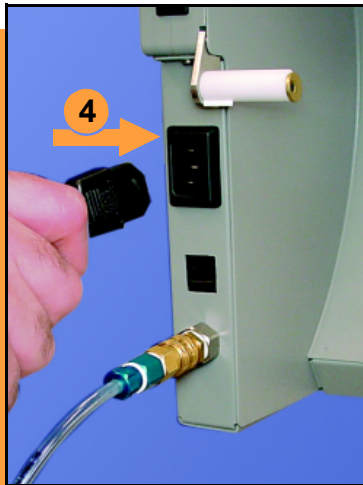
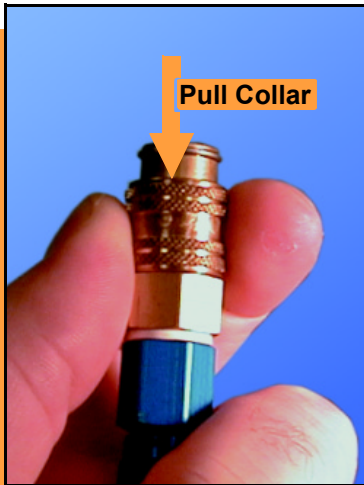
NOTE: Compressed air must be clean and dry at approximately 75 psi (5.25 kgf/cm²).



Warning



Point Air Hoses Away From Body.
Wear Approved Eye Protect.



3. To disconnect the hose, grasp the collar on the connector and pull back.

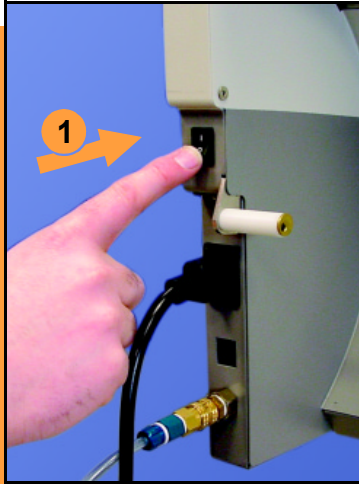
NOTE: The air line is equipped with a "quick connect" that will stop airflow when disconnected.

4. Connect to a grounded power source using a cable with a standard IEC 320 plug.

The RoadRunner accepts power between 100 and 240 VAC, 50/60Hz. ■



Running the Self-Test



To run the Self-Test:

1. Turn the power switch On (I).

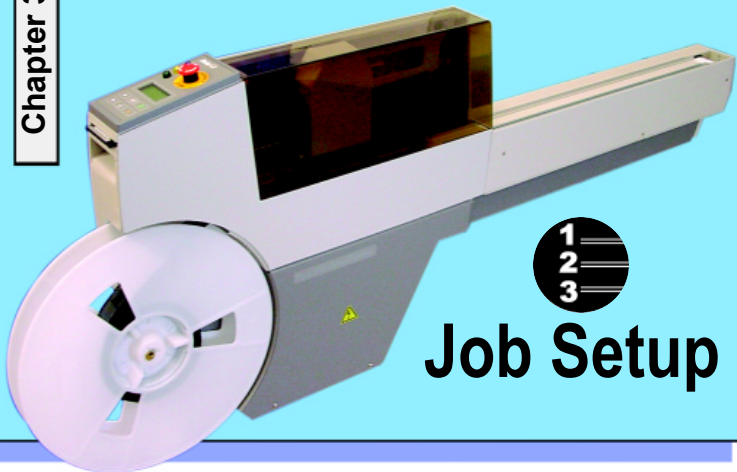
All the control panel indicator lights will come on. When the Self-Test finishes, the blue light will remain on and the version number will display.

If all the indicator lights start blinking, a serious error has occurred. Turn the unit off then on again. If the error continues, have the unit serviced.

2. If no errors display, the RoadRunner is operation ready. ■



Chapter 3



Job Setup

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Changing the Actuator Plate 22

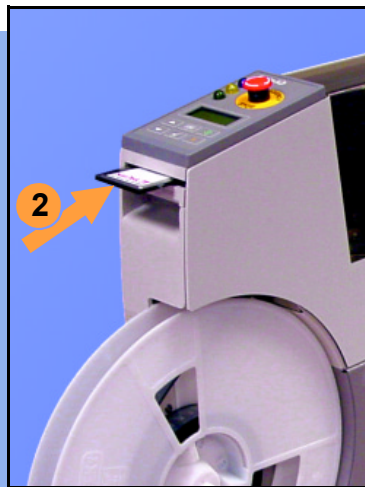
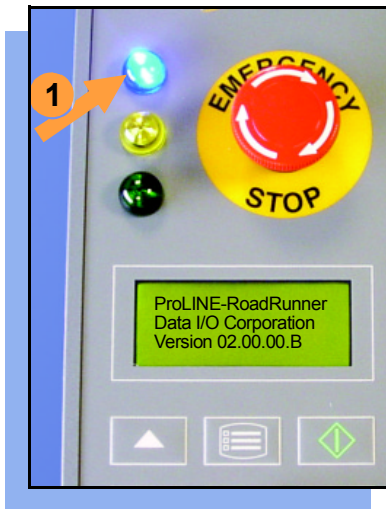
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Inserting a Job Card



To run a job, insert a TaskLink job card into the PCMCIA card slot. Use only Type I or Type II PCMCIA cards.

To insert a job card:

1. If the power switch is on, make sure the blue lamp is lit.
2. Slide the job card into the PCMCIA card slot.



Caution



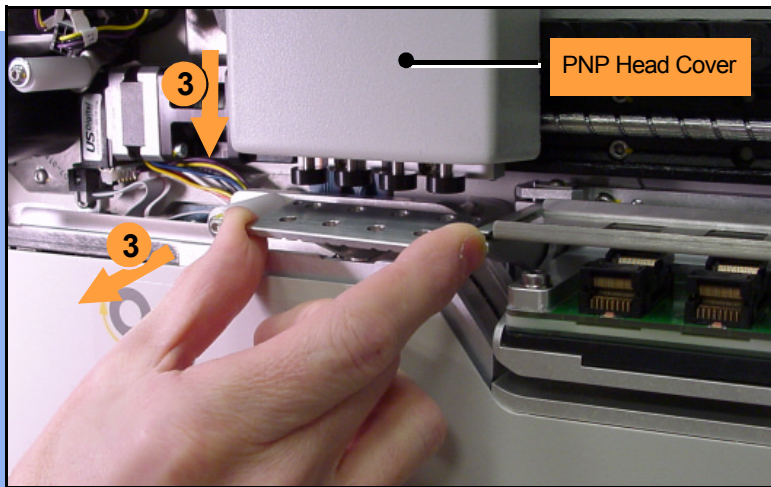
Electrostatic Discharge May Cause Damage. Discharge Static Against Common Ground Prior to Inserting a Job Card.



3. Press to seat the card. When fully inserted, the job card extends slightly from the PCMCIA card slot.
 4. The **Card Eject** button can be pressed to remove the card.
- Do not eject the card unless the blue lamp is lit. ■



Changing the Precisor



To change the precisor:

1. Select **Job**, then **End**, wait for the blue lamp to light and turn the power Off (0).
2. Lift off the Robotics Cover.
3. Starting at one end, pull the precisor down off the magnet, and then pull the other end off.

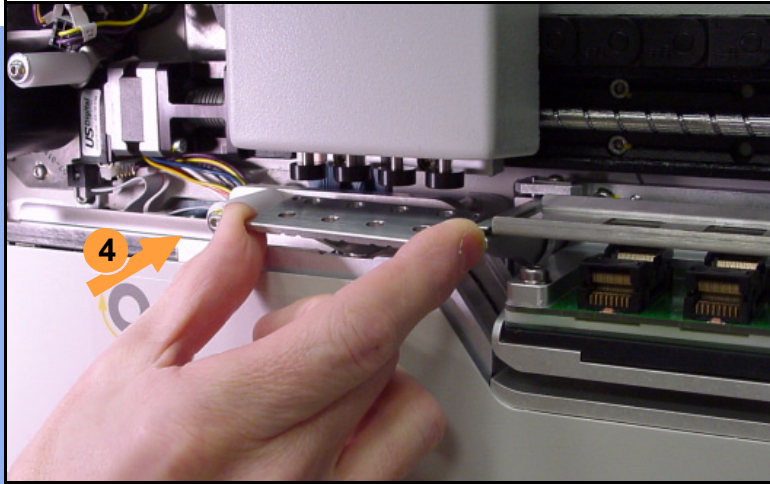
The PNP Head Cover can be removed for easier access. It pulls straight off.



Warning



Pinch Warning. Keep Hands
Away From Moving Parts

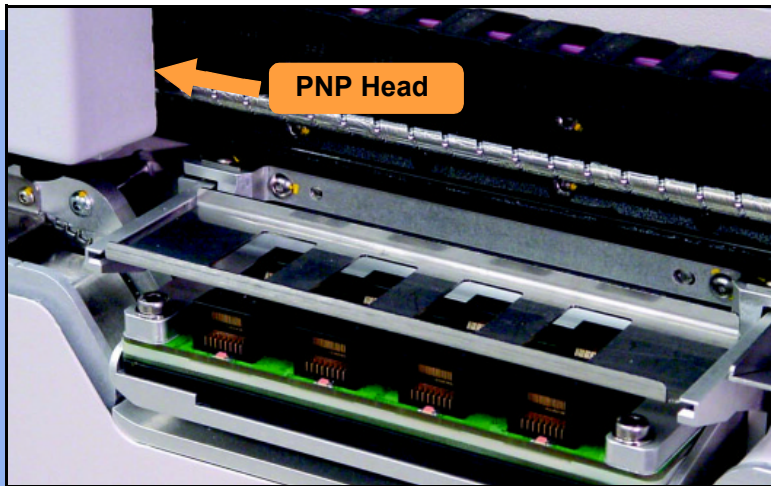


4. When inserting the new precisor, make sure that the part number faces up and that the small holes near the precisor edge fit over the dowel pins on the head.

There should be no visible gap between the precisor and the head. ■



Changing the Actuator Plate



To change the actuator plate:

1. Select **Job**, then **End**, wait for the blue lamp to light and turn the power Off (0).
2. Lift off the Robotics Cover.

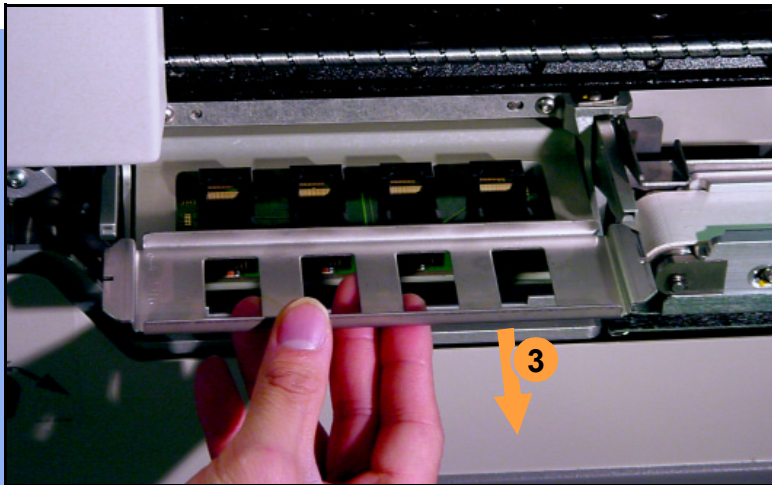
When power is off, the PNP Head can be moved by hand to allow access to the actuator plate.



Warning



Pinch Warning. Keep Hands
Away From Moving Parts



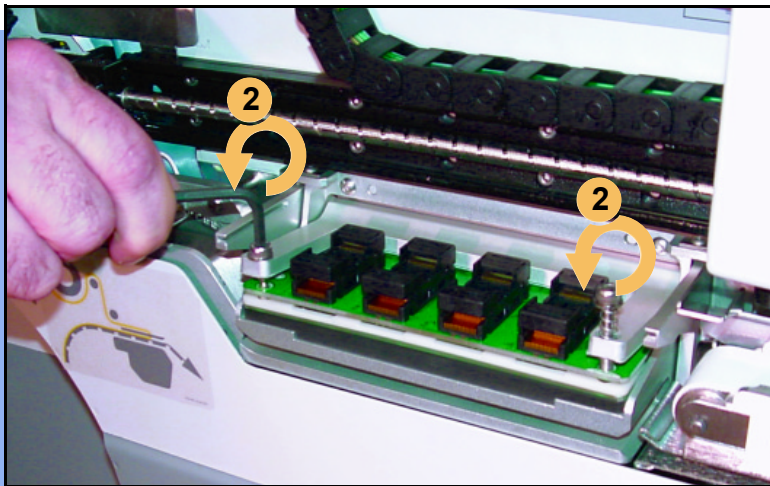
3. Pull the actuator plate to slide it out of the grooved brackets.

NOTE: The actuator plate must be out to access or change the socket adapter.

To change the socket adapter, see the procedure on the following page. ■



Changing the Socket Adapter



To change the socket adapter (with the actuator plate removed):

1. Make sure the power is Off (0).
2. Unscrew the two captive screws and lift the adapter holder.



Warning



Pinch Warning. Keep Hands
Away From Moving Parts.

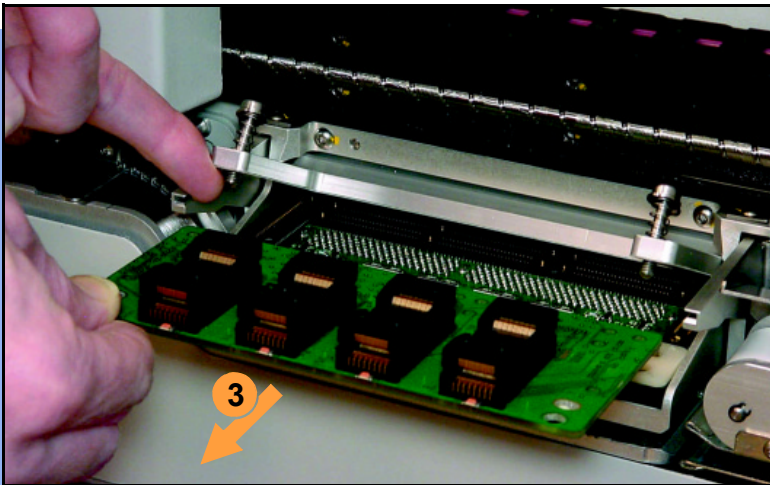


Caution



Electrostatic Discharge May Cause Damage.
Discharge Static Against Common Ground.





3. Without touching the gold contact surfaces on the bottom of the adapter, lift the adapter free.

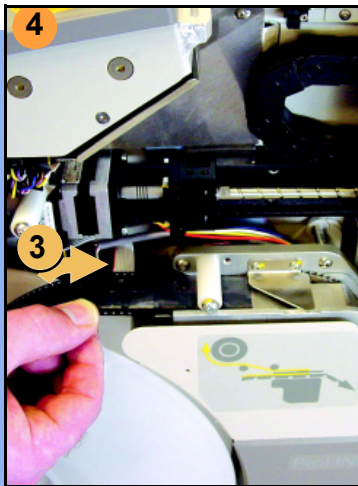
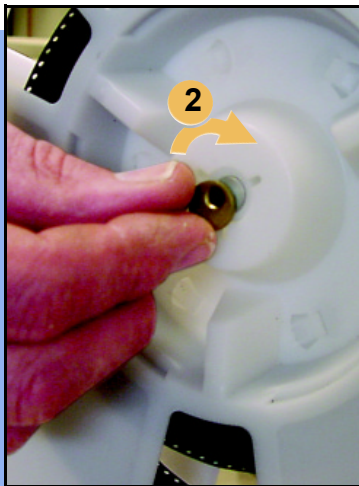
4. Insert the correct adapter, making sure that it seats on the dowel pins.

NOTE: Each device may have its own socket adapter.

5. Tighten the screws and replace the actuator plate. ■



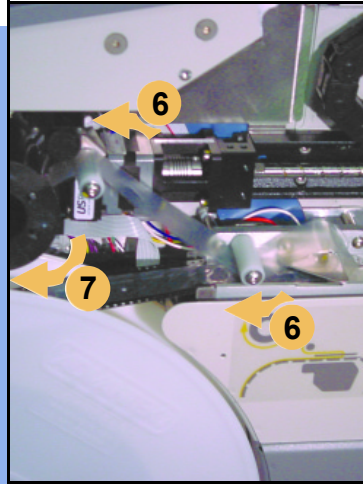
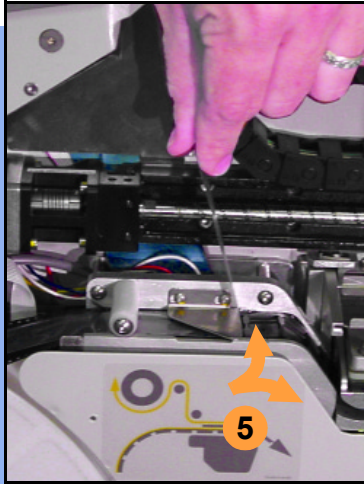
Loading and Threading Device Tape



To load and thread device tape:

1. Place a reel onto the RoadRunner spindle.
2. Lock the reel in place by rotating the brass button on the spindle end.
3. Insert the device tape into the Tape-In Module and onto the sprocket.
4. Select **Advance Pocket** from the operator menu, then press the **Up Arrow** button.





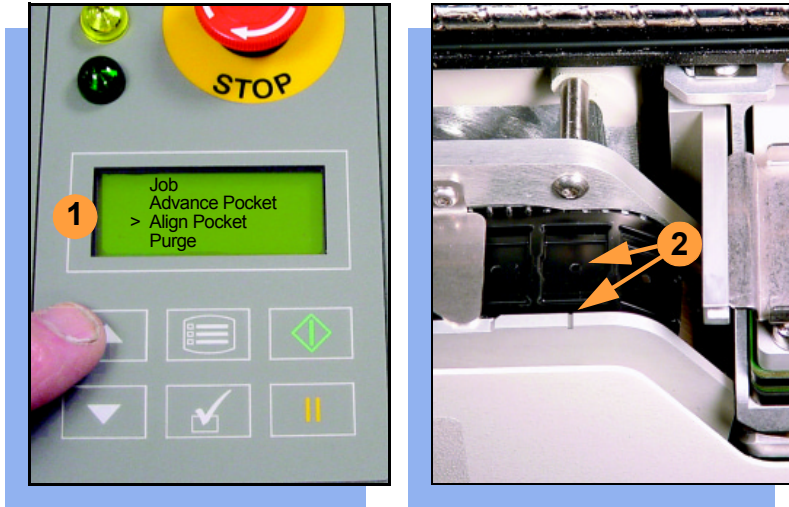
5. When the tape is advanced past the peel bar, separate the cover tape from the device tape.
6. Thread the cover tape up through the cover tape path and attach it to the Cover Tape Take-Up Reel. Advance the tape as necessary.

NOTE: A small piece of adhesive tape may be needed to stick the cover tape to the Take-Up Reel.

7. Turn the Take-Up Reel to take up slack cover tape.
8. Align the tape pockets as described in the following procedure. ■



Aligning the Tape Pockets



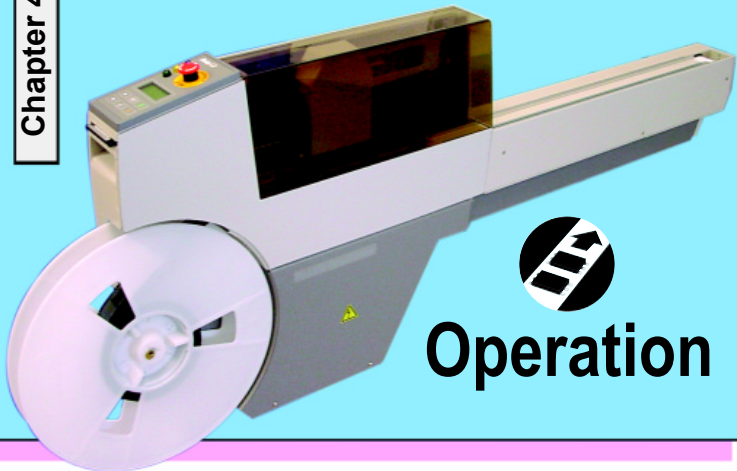
To align the tape pockets:

1. Choose **Align Pocket** from the Operator Menu.
2. Press the **Up Arrow** to advance the tape until the next pocket center hole is approximately centered at the pick point alignment mark. *Do not* advance devices past the pick point. They may fall and jam the tape path. *Do not* use the Down Arrow to align.

NOTE: This alignment procedure must be performed each time power is applied, such as after releasing the **Emergency Stop**. ■



Chapter 4



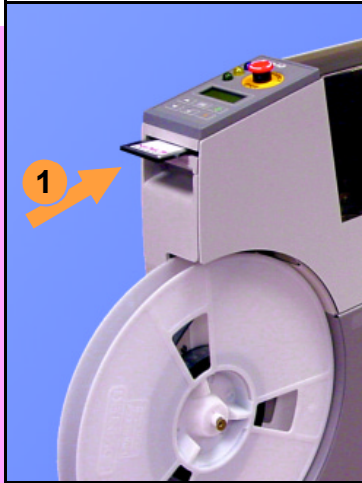
Operation



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Pausing or Stopping a Job	31
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Emptying the Reject Bin	34
Emptying Cover Tape	35
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Restarting a Job	38



Running a Job



To run a job:

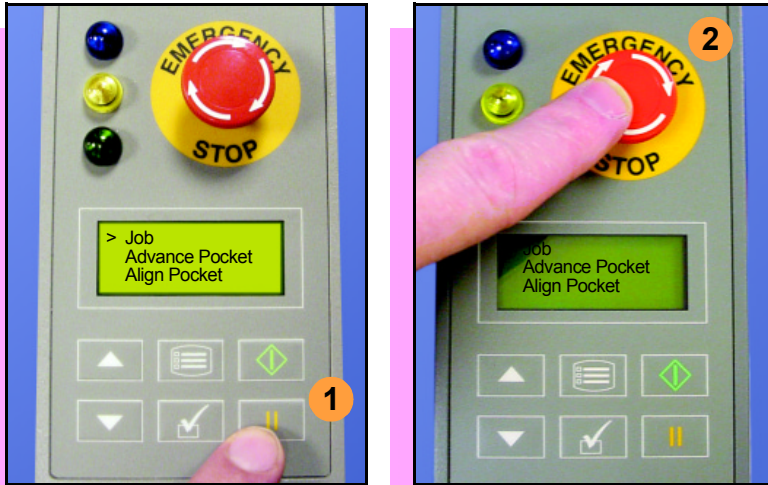
1. Insert a job card in the PCMCIA card slot.
2. Clear the conveyor belt of any unneeded devices.
3. Press **Start**.

The green light will start blinking.

When the programmed devices reach the assembly machine pick point, the belt will pause and the green light will stay lit without blinking. ■



Pausing or Stopping a Job



To pause at the end of the current operation:

1. Press **Pause** on the control panel.

To instantly stop in an emergency situation:

2. Press the **Emergency Stop** button. ■



Ending a Job



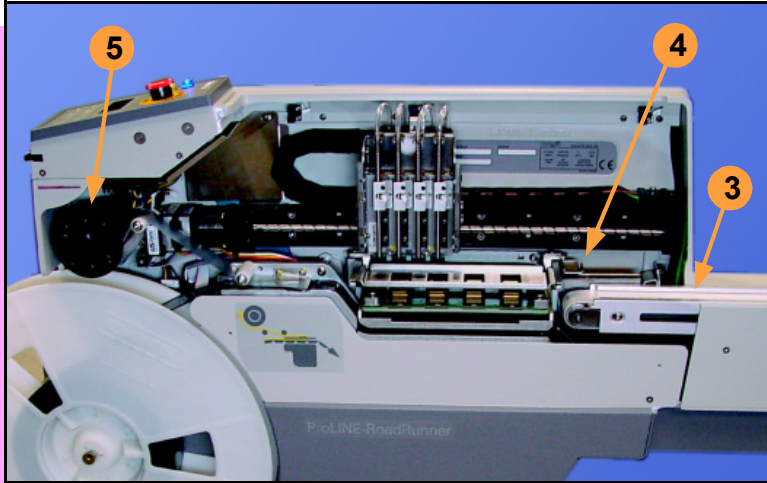
Whenever you change job cards, you must first end the current job.

To end the current job:

1. Press **Pause**.
2. Select **End** from the Job menu. Job is in the top menu.



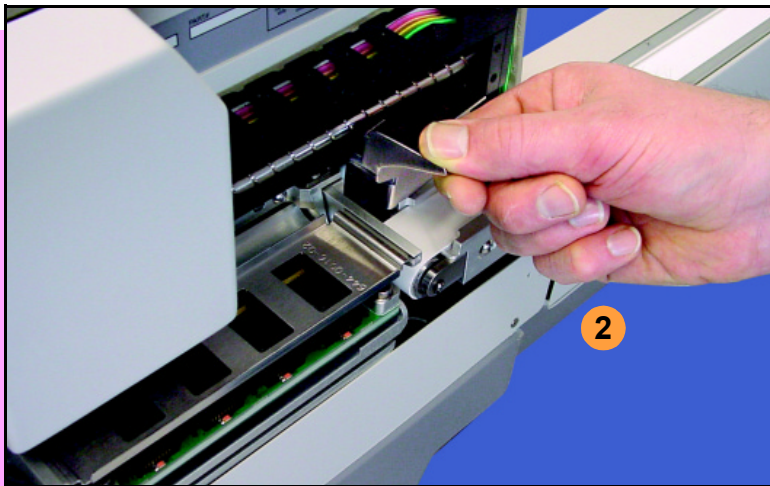
The system will finish processing parts and place the parts on the belt, but no additional devices will get picked from the tape.



3. Clear away excess devices from the conveyor belt.
4. Empty the reject bin. See page 34.
5. Empty the Cover Tape Take-Up Reel. See page 35. ■



Emptying the Reject Bin



To empty the reject bin:

1. Press the **Pause** button.
2. Lift the reject bin out by grabbing the finger tab and then lift up and out.

When reinserting the reject bin, be sure the bin is *completely* lowered and that the tab is correctly positioned. ■

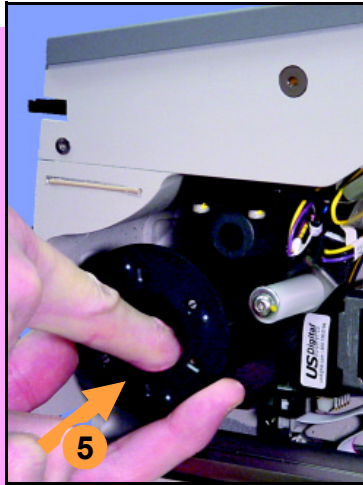
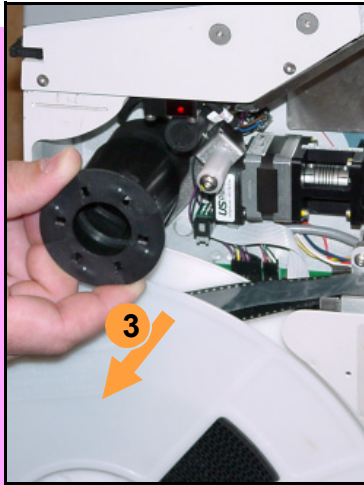


Warning



Pinch Warning. Keep Hands
Away From Moving Parts.

Emptying Cover Tape



To empty the Cover Tape Take-Up Reel:

1. Press **Pause**.
2. Cut the cover tape, leaving enough slack to reattach.
3. Pull the Take-Up Reel straight out.
4. Unwind the used cover tape and discard it.
5. To replace the Take-Up Reel, slide it on and rotate it until any two holes line up with the pins. ■

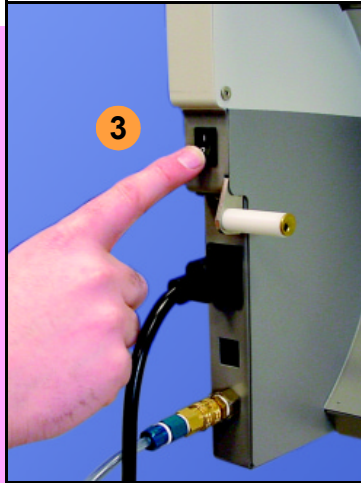


Warning



Pinch Warning. Keep Hands
Away From Moving Parts.

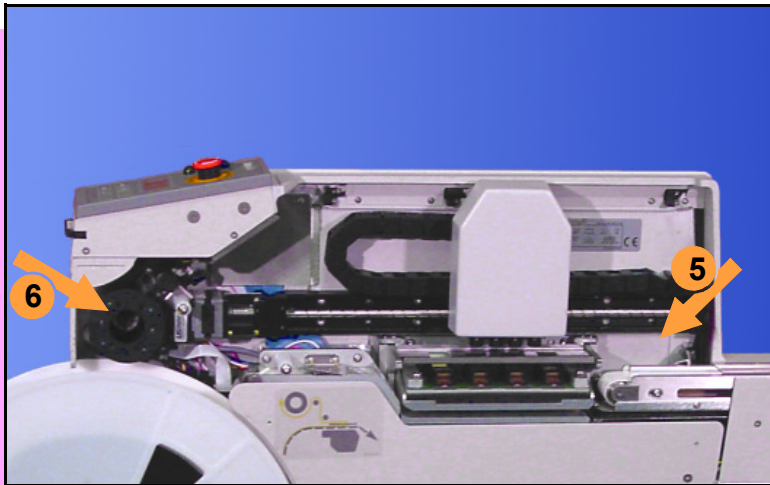
Shutting Down



To shut down the ProLINE-RoadRunner:

1. Press **Pause**.
2. Select **End** from the Job Menu and wait for all devices to be placed on the belt.
3. Turn the power Off (0).
4. Remove devices from the conveyor belt.



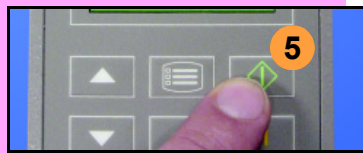
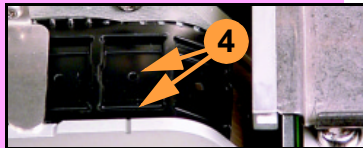
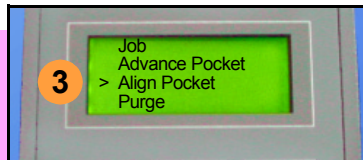


5. Empty the reject bin.
6. Remove and empty the Take-Up Reel.
7. Disconnect the air hose or shut off the air flow.

NOTE: When disconnecting the air hose, pull the connector collar back as you pull the connector off. ■



Restarting a Job



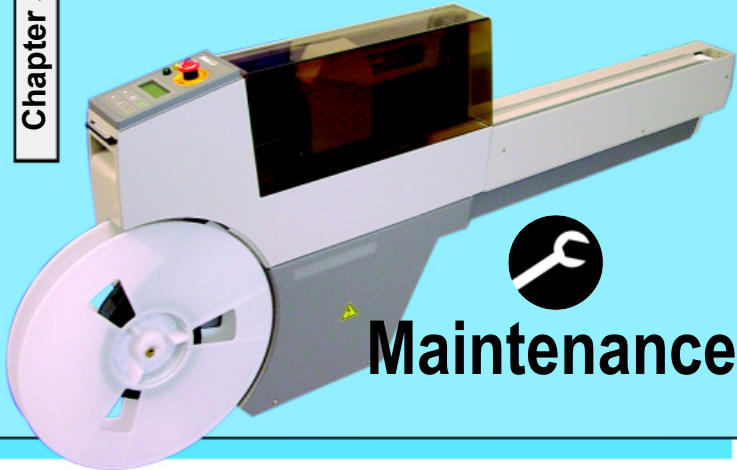
To restart the RoadRunner after a pause or an emergency stop:

1. Turn the **Emergency Stop** button clockwise to release it, if needed.
2. Press **Menu** until the top level menu is displayed.
3. Select **Align Pocket**.
4. Press the **Up Arrow** to advance the device tape until the *next* pocket center hole lines up with the alignment mark.
5. Press **Start**.

The job will resume. ■



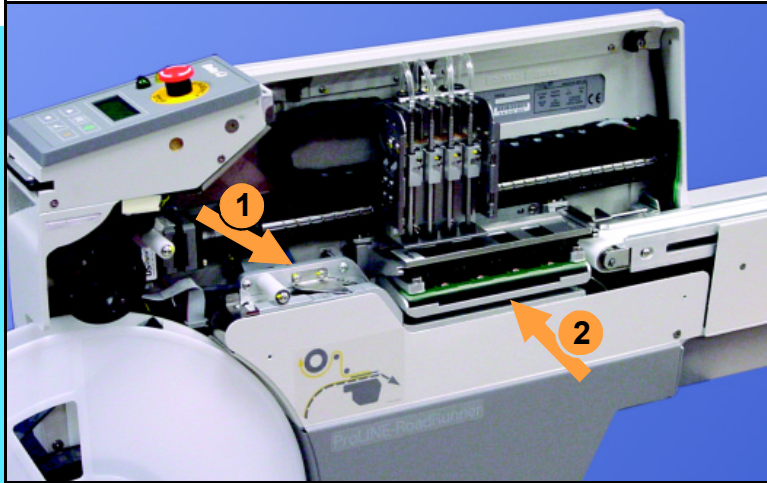
Chapter 5



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Cleaning with Air



To prevent dust accumulation, inject compressed air into the following component areas:

1. Tape-In Module (weekly).
2. Sockets (daily). Sockets should be opened and closed by hand while air is injected.

NOTE: Compressed air must be clean and dry. ■

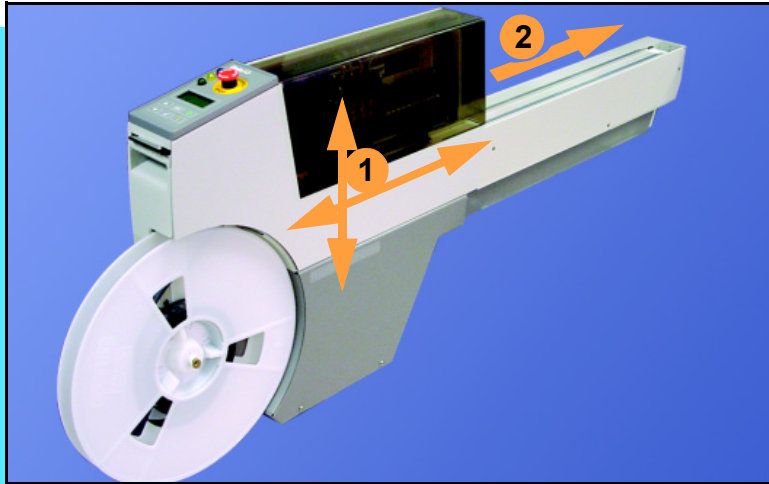


Warning



Point Air Hoses Away From Body.
Wear Approved Eye Protection.

Cleaning with Alcohol



To prevent accumulations of dust and oil, clean the following component areas with isopropyl alcohol on a lint-free cloth.

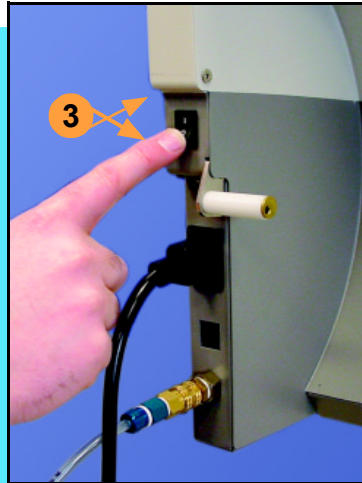
1. Chassis and robotics covers (every 3 months).
2. Conveyor belt (daily). See “Device Rotation” on page 48.

NOTE: Dry the conveyor belt before rotating it.

These intervals are based on running 40,000 devices weekly. ■



Running the Self-Test



Run the Self-Test procedure approximately once a week.

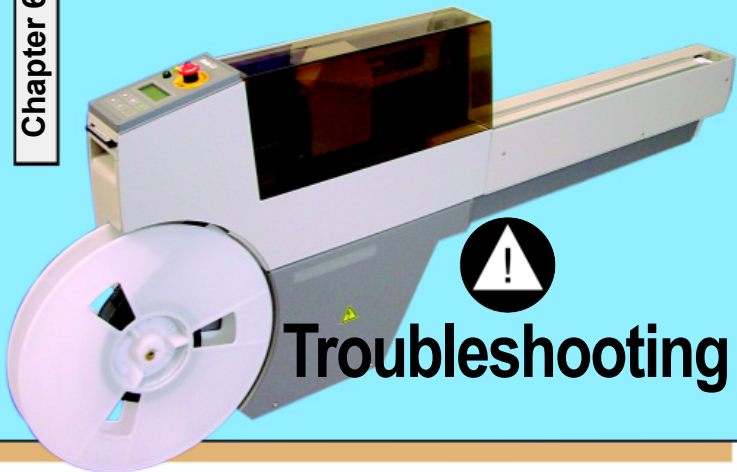
To run the Self-Test procedure:

1. Press **Pause**.
2. Clear all devices from the sockets and from the conveyor belt.
3. Toggle the power switch off and then back on.

The Self-Test will run, checking the condition of the components.

4. Check the display for system errors. ■





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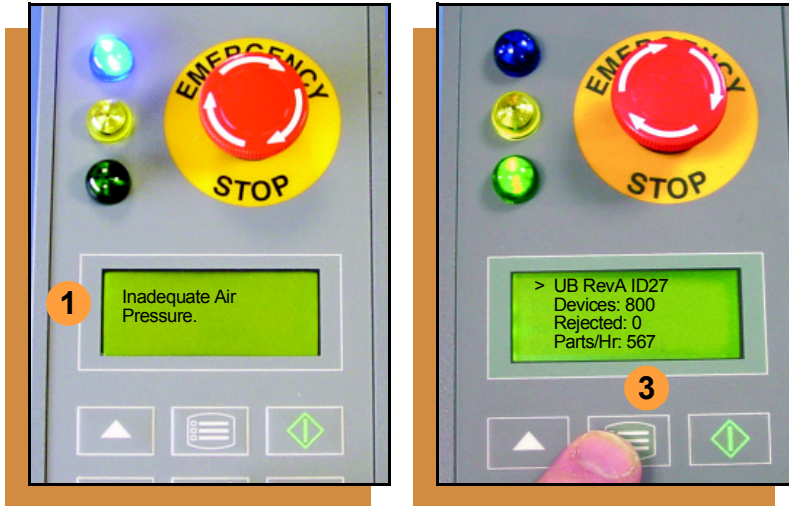
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Viewing Errors



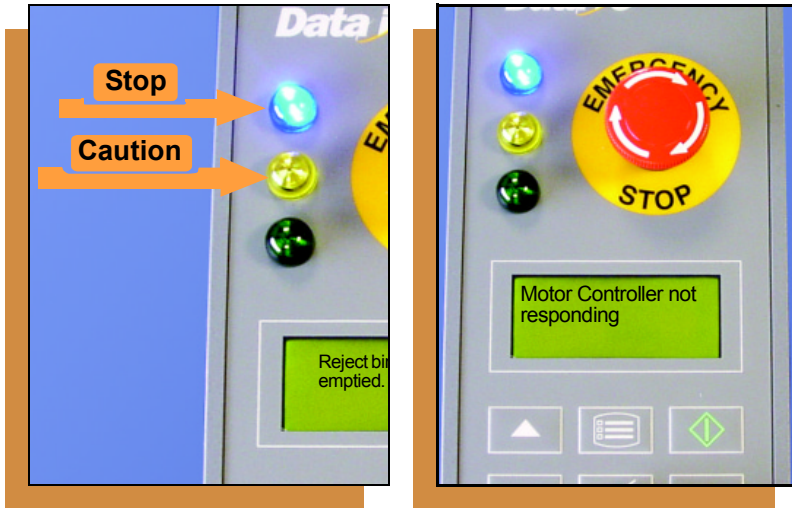
To view and correct errors:

1. Messages will appear in the keypad display.
2. Check the condition—tape path, reject bin, etc.—implied by the message.

If you cannot correct the error condition, contact a service technician.

3. Press **Menu** to remove the message.

If there are other error messages the next one will appear.



Some common error messages are listed below. For more information see “Troubleshooting” in the *ProLINE-RoadRunner Owner’s Manual*. ■

Lamp Color	Error Message
No change in lamps	Card not present
Yellow	Reject bin needs to be emptied
Blue	Cover tape broken
Blue	Emergency Stop is activated ¹
Blue	Motor controller not responding ²

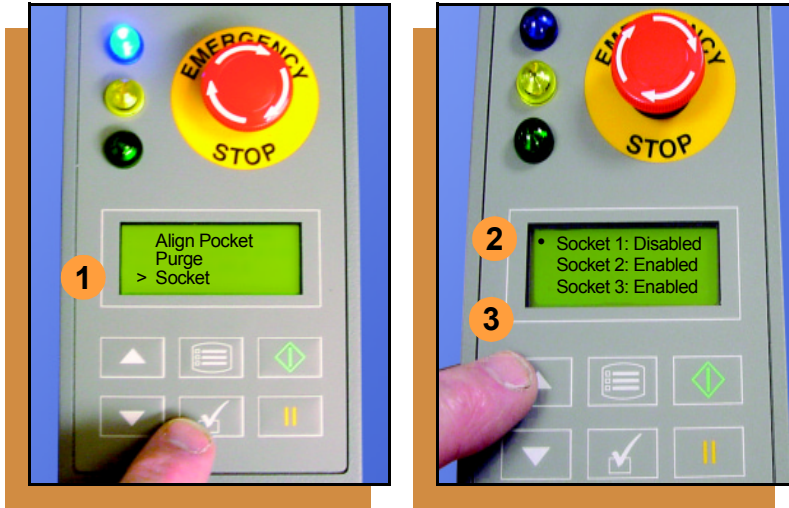
¹Twist the Emergency Stop button to release it.

²Check that the Emergency Stop button is released.





Enabling a Socket



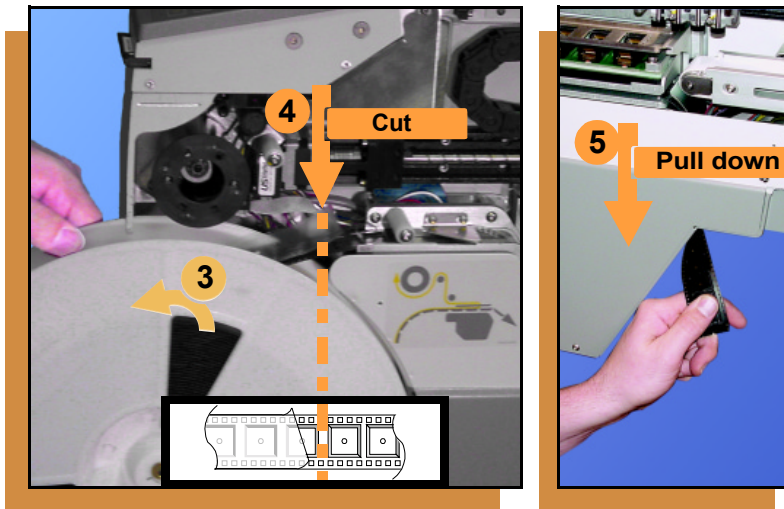
If a socket repeatedly becomes disabled, the RoadRunner should be serviced.

To re-enable a disabled socket:

1. Select **Socket** from the top-level menu.
2. Scroll down and select the socket from the Socket menu. A dot appears next to the socket.
3. Press the **Up Arrow** button to re-enable the socket.

NOTE: To disable a probe, disable the probe's corresponding socket. ■

Clearing Jammed Tape



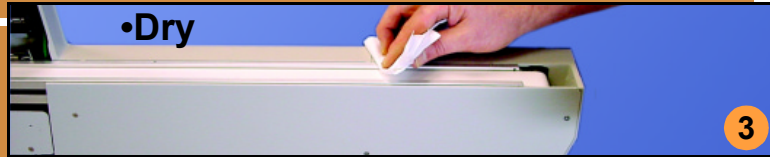
If the tape jams, an error message displays; the blue lamp illuminates.

To clear the tape path:

1. Press the **Emergency Stop** button (to continue the job later) or select **Job**, then **End**, and turn the power off.
2. Unroll one turn of cover tape and cut it near the Take-Up Reel.
3. Pull the tape out backwards until the cover tape end is free.
4. Cut the pocket tape.
5. Pull the tape down where it exits to remove it from the machine.
6. Trim away any flaws before reloading. ■



Device Rotation



If devices rotate excessively on the conveyor belt:

1. Press **Pause**. Wait for all the devices to get picked from the belt.
2. Press the **Emergency Stop**.
3. Remove the Dust Cover and clean only the exposed surface of the conveyor belt with isopropyl alcohol on a lint-free cloth, *then dry it*. Rotate the belt by hand and repeat until clean.
4. To continue, replace the Conveyor Dust Cover, release the **Emergency Stop** button and press **Start**. ■

Technical Support

Contact your local Data I/O representative or see the contacts below. To find your local representative on the World Wide Web go to <http://www.dataio.com/contact/repsearch.asp>

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