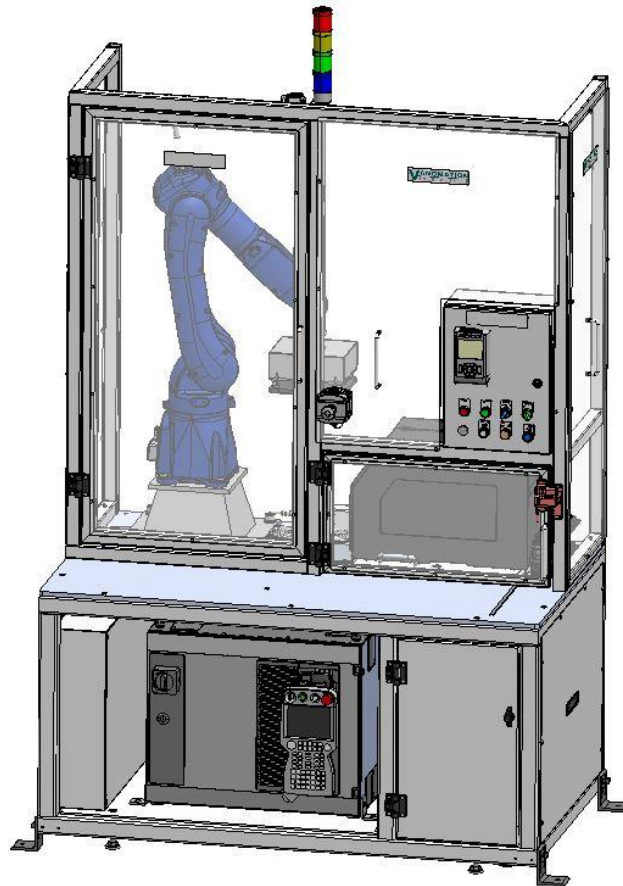


RPA (Robotic Printer Applicator) Manual



***Release 10/31/2019
NOT FOR RESALE
© 2019 by Vanomation
All Rights Reserved
Part Number: 510684
Version 1.1***

Vanomation, Inc.
9241 Research Drive
Irvine, CA 92618
TEL: (877)228-2992
FAX: (949) 861-9020
www.vanomation.com

PREFACE

PURPOSE OF THIS MANUAL

This manual was written to show procedures for operating and maintaining the RPA (Robotic Printer Applicator).

DISCLAIMER

Be aware that the steps described in this manual may vary based on new settings, software versions, and options that may have been added to the system since the compilation of this manual.

The information contained within this document is the proprietary property of Vanomation, Inc., and may not be copied, reproduced or transmitted to other parties without the expressed written authorization of Vanomation, Inc.

Because we are constantly improving our products, we reserve the right to change specifications without notice.

NOTE: *This manual is not for resale and will not be sold separately. All training manuals developed by VANOMATION are copyrighted. Do not copy any portion of these manuals*

Table of Contents

1	RPA Operation.....	6
1.1	System Overview	6
1.2	Operator Control Panel.....	9
1.3	Printer Control Panel.....	11
1.4	Robot Pendant HMI Interface.....	12
1.5	RPA Utility Consumptions.....	13
1.5.1	Electrical.....	13
1.5.2	Pneumatic	13
1.6	RPA IO and Power Distribution Enclosure.....	14
1.6.1	Printer Interface Boards	14
1.6.2	24 VDC Power Supply (PS-1).....	14
1.6.3	Fuses.....	14
1.6.4	Safety Control Module.....	14
1.7	Printer IO Interface Board (Left, IF-1, IO 1 - 8)	15
1.8	Printer IO Interface Board (Right, IF-2, IO 9 - 16)	16
1.9	IO List	17
1.10	Time Delay Menu on T8306 Printer	18
1.11	RPA IO Test Menu on T8306 Printer.....	19
1.12	System Startup	20
1.12.1	RPA Power ON.....	20
1.12.2	Running in Manual Mode	20
1.12.3	Running in Auto Mode.....	21
2	Light Tower Definition.....	23
3	Emergency Stop/Safety Interlocks and Error Recovery Mode	24
3.1	E-Stop Buttons and Safety Interlocks	24
3.2	Resume Operation from an E-STOP or System Error	25
4	Loading Printer Labels	26
5	RPA Settings.....	27

5.1	Time Delay (on Robot Pendant)	27
5.2	Air Pressure (On Pressure Regulator)	27
5.3	Printer Speed (On Printer Media Menu)	27
5.4	Pressure Blocks (On Printer)	27
5.5	Pre-Delay (On RPA Menu)	27
5.6	Post-Delay (On RPA Menu).....	27
6	Serial Numbers.....	28

Table of Figures

Figure 1: RPA Main System Components	7
Figure 2: RPA Main System Components – Printer is slid out for Label Loading/Unloading	8
Figure 3: Operator Control Panel.....	9
Figure 4: Operator Control Buttons and Switches	10
Figure 5: Printer Control Panel	11
Figure 6: Robot Pendant HMI Interface.....	12
Figure 7: RPA FRL	13
Figure 8: IO and Power Distribution Enclosure Layout	14
Figure 9: Printer IO Interface, IF-1 (IOs 1 - 8).....	15
Figure 10: Printer IO Interface, IF-2 (IOs 9 - 16).....	16
Figure 11: Test Mode Menu	19
Figure 12: Waiting Robot Ready	21
Figure 13: Waiting to START	22
Figure 14: Printer in AUTO MODE	22
Figure 15: E-Stops and Safety Interlocks.....	24
Figure 16: Loading Labels.....	26
Figure 17: Pressure Block Settings	27

1 RPA Operation

1.1 System Overview

This manual covers the operation of the RPA and its components. The RPA prints and applies label(s) onto the product.

The RPA consists of the following components: (Refer to Figure 1)

1. Standard Yaskawa GP7 Robot with 1m reach
2. 6" x 8" EOAT (End Of Arm Tool) with Compliance
3. Standard Yaskawa YRC1000 Controller with Color Pendant
4. Printronix T8306 Thermal Printer on Sliding Shelf
5. System Status Stack Light (Red, Amber, Green and Blue colors). See section 5 for detail
6. Operator Control Panel
7. IO/Power Distribution Enclosure
8. E-Stops and Door Interlocks

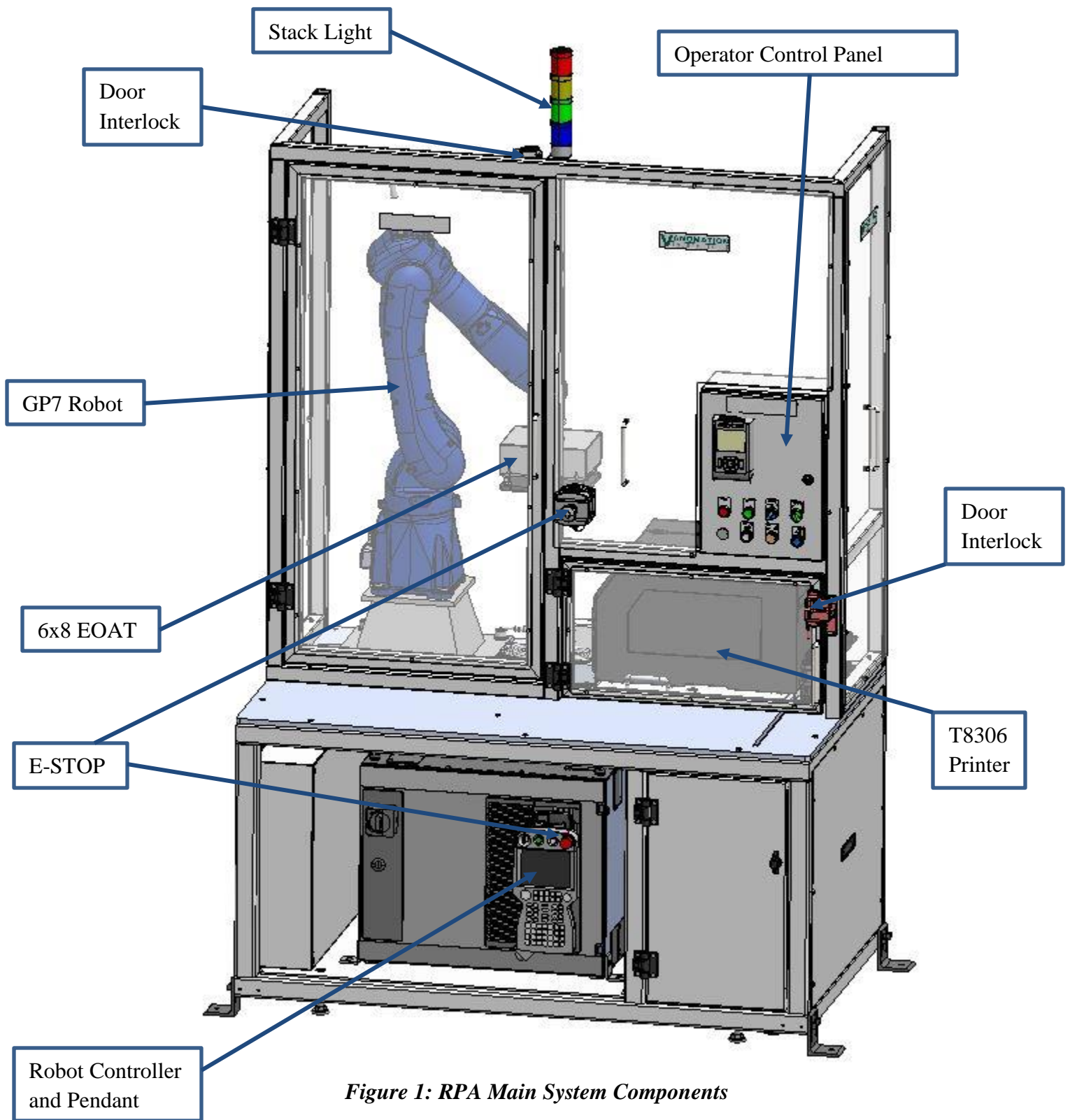


Figure 1: RPA Main System Components

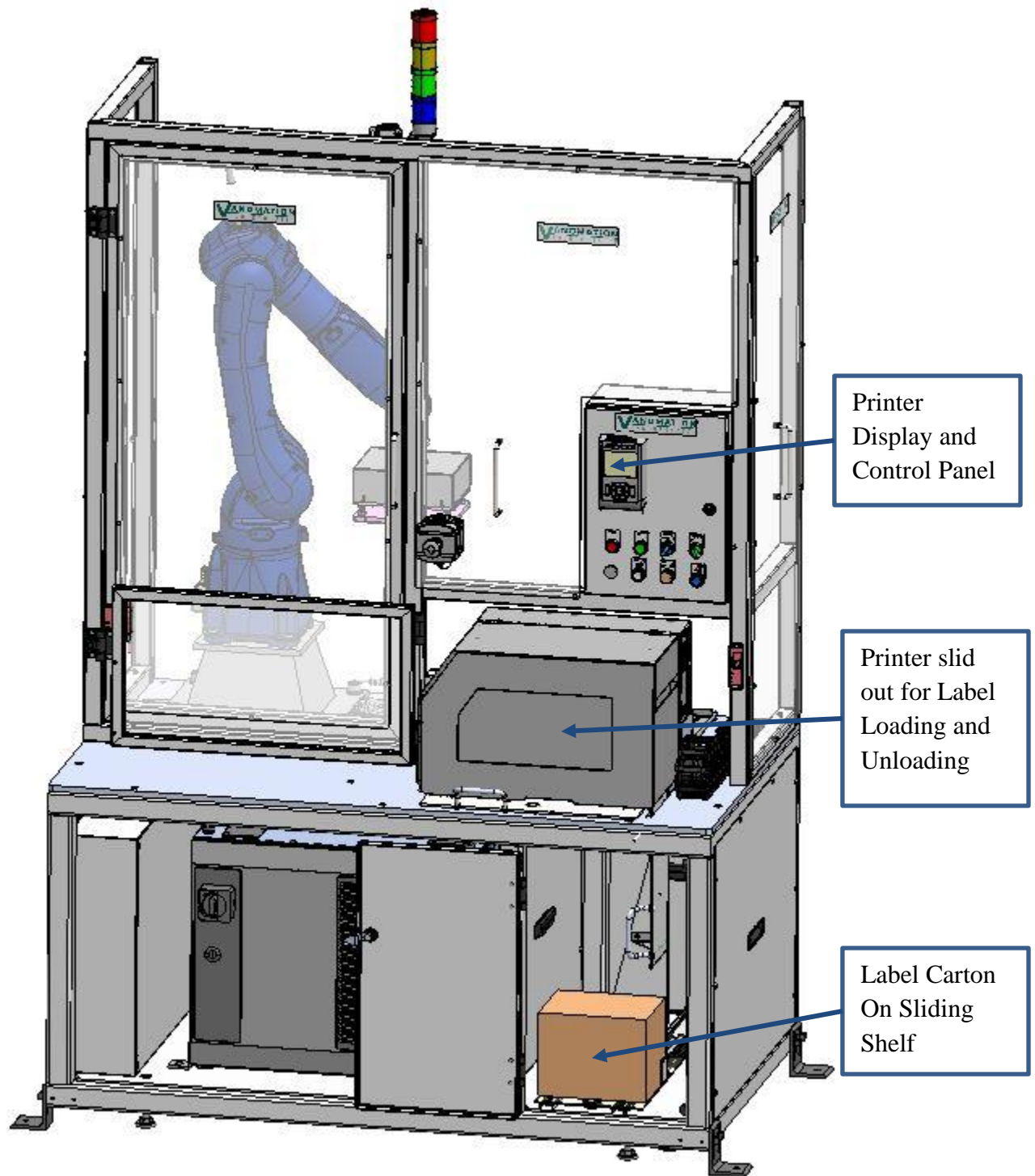


Figure 2: RPA Main System Components – Printer is slid out for Label Loading/Unloading

1.2 Operator Control Panel

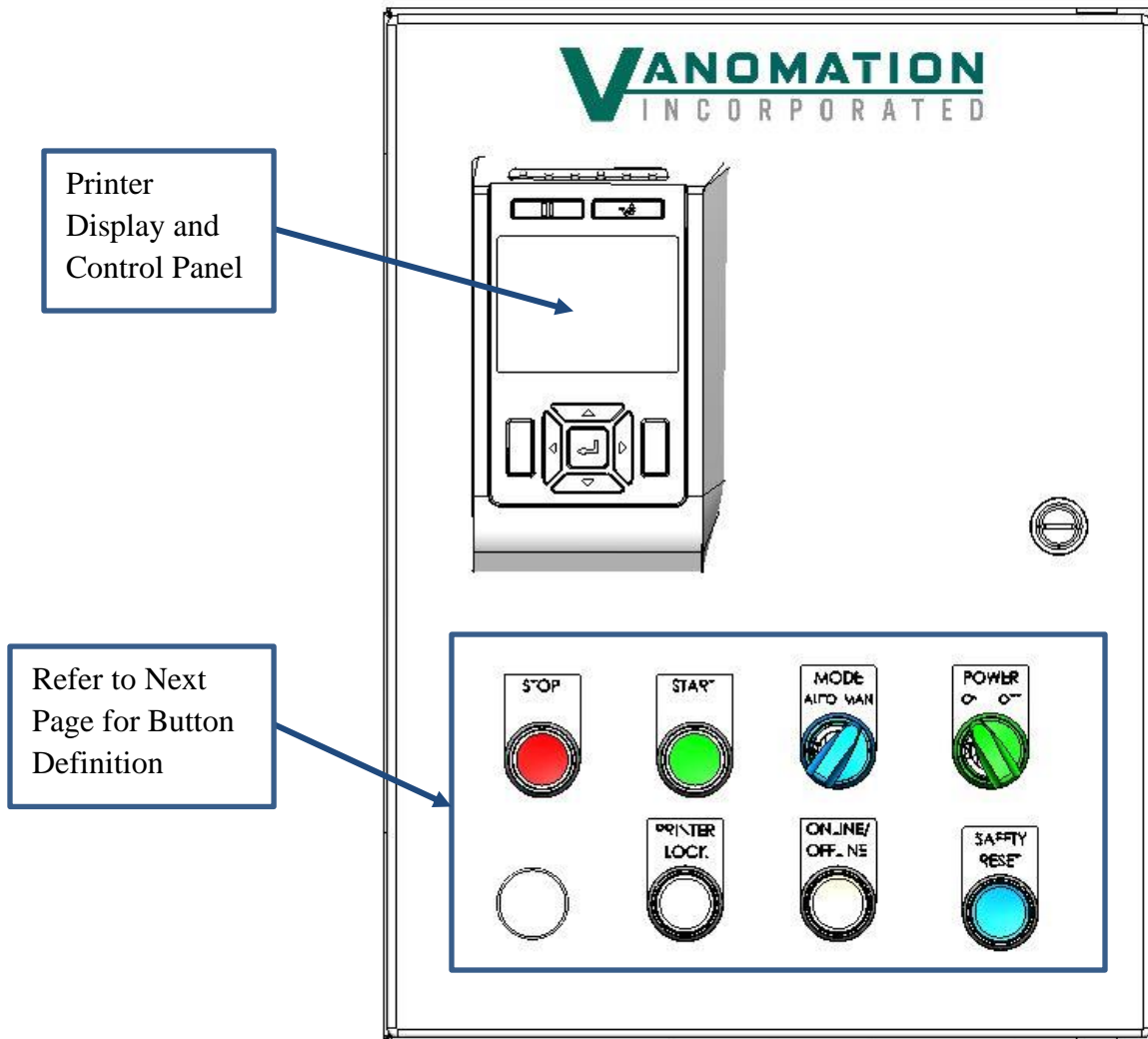


Figure 3: Operator Control Panel

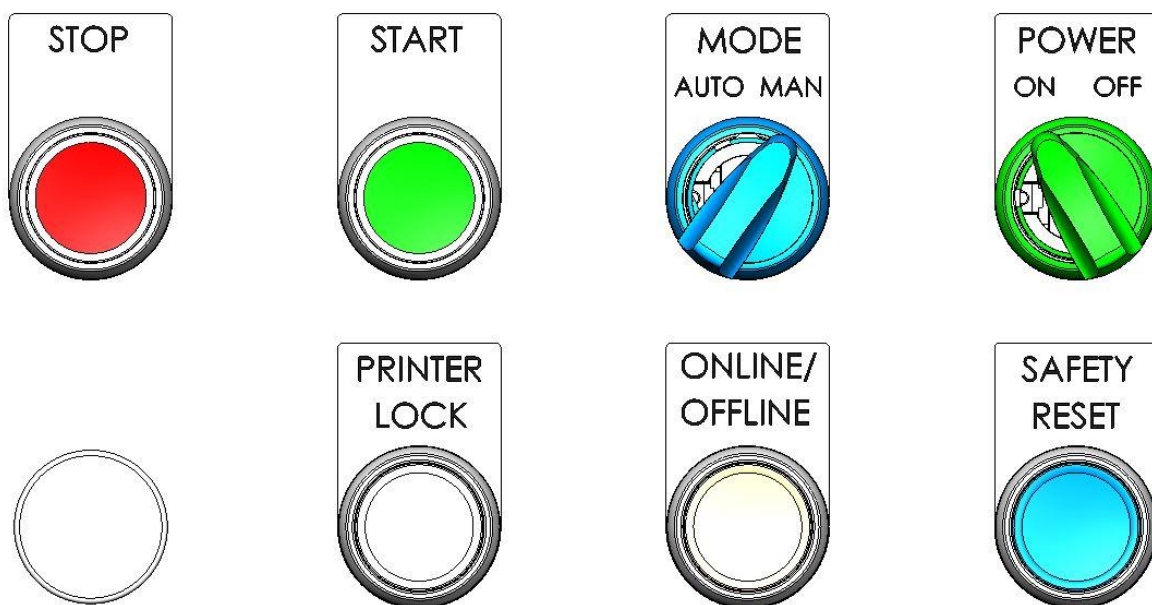


Figure 4: Operator Control Buttons and Switches

POWER Switch	Printer Power Switch (120 VAC for Printer and 24VDC Power Supply)
MODE Switch	Auto/Manual Mode. Blue LED light ON is AUTO mode
START Button	Start the Print Job / Print Next Label in Manual Mode
STOP Button	Stop the Print Job
PRINTER LOCK Button	Lock Printer Slide in Auto Mode. White LED light ON is Locked
ONLINE/OFFLINE	Printer Online/Offline. Amber LED light ON is ONLINE
SAFETY RESET Button	Reset Safety (for Safety Light Curtain Option Only)

1.3 Printer Control Panel

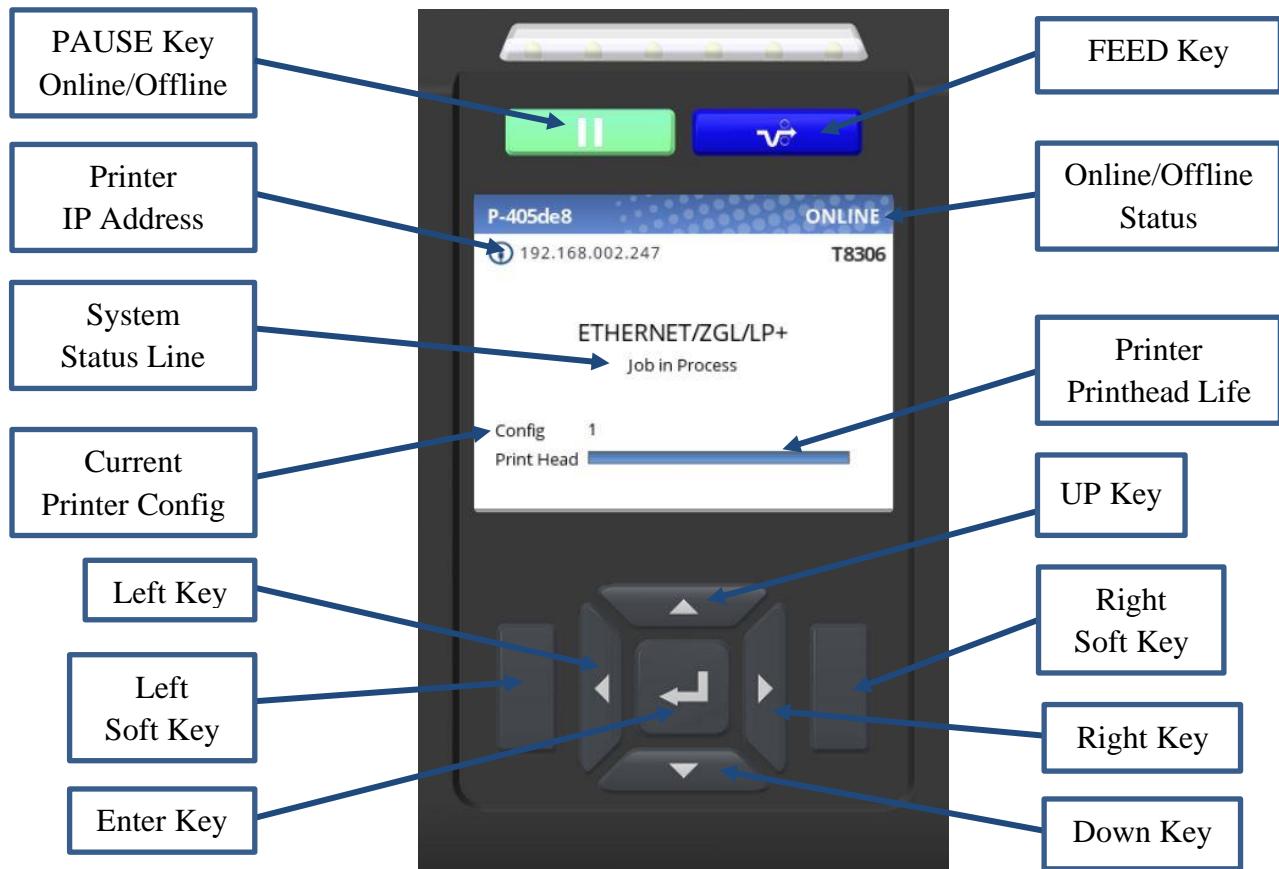
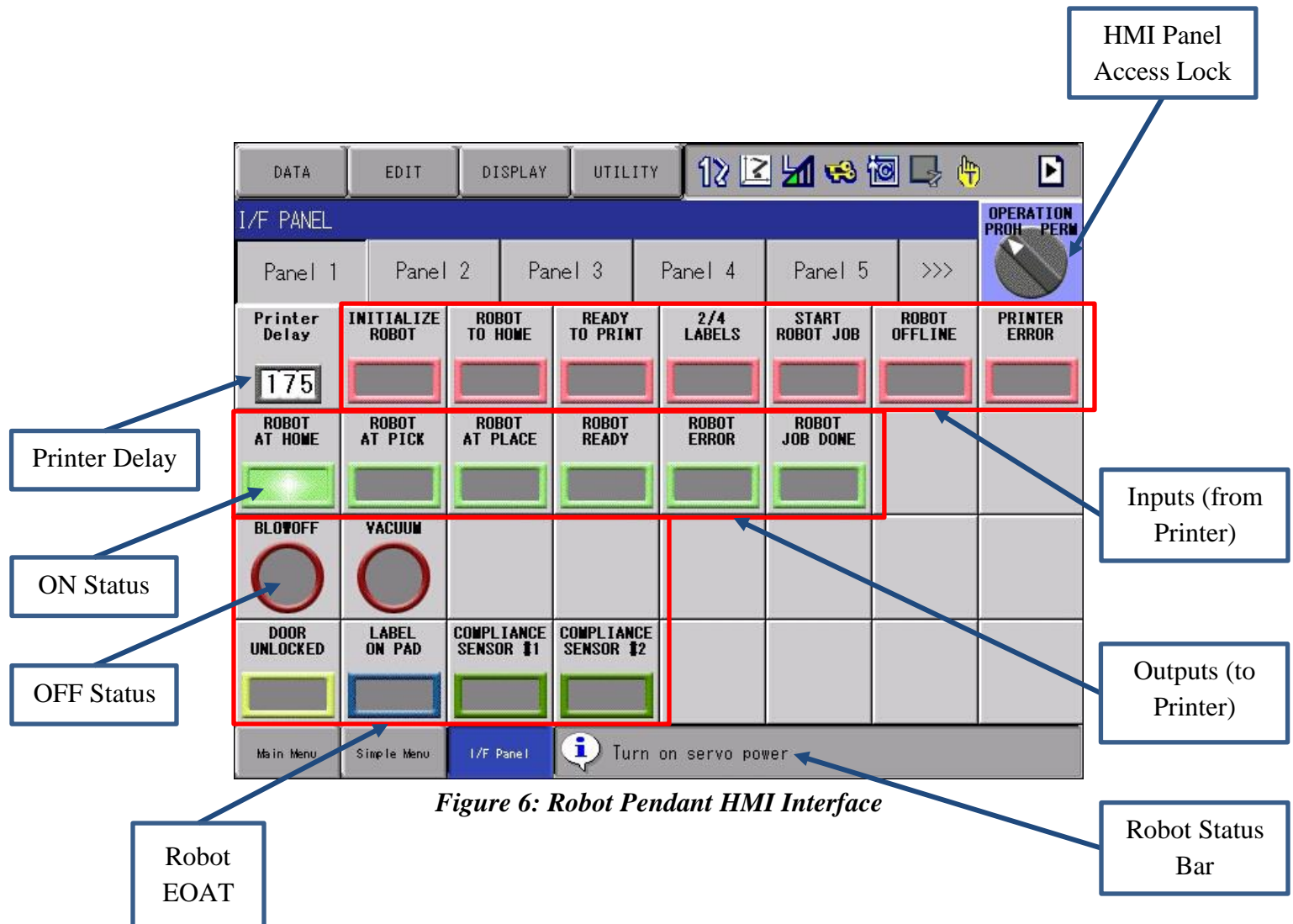


Figure 5: Printer Control Panel

1.4 Robot Pendant HMI Interface

- The HMI Panel Access Lock must be unlocked to access Printer Delay.
- To Unlock, Press INTERLOCK and Select OPERATION
- To Lock, Press INTERLOCK and Select OPERATION again



1.5 RPA Utility Consumptions

1.5.1 Electrical

- 480 VAC 3 Phase: 2A
- 120 VAC 1 Phase 6A (for Printer)
- 120 VAC 1 Phase 1A (for IO Distribution)
- 120VAC Printer Fuse (FU-301): 6A, ¼" x 1.25"
- 120VAC Power Supply Fuse (FU-304): 1A, ¼" x 1.25"
- 24VDC Fuse (FU-305): 2A, ¼" x 1.25"

1.5.2 Pneumatic

- 5 SCFM
- Pressure 65 psi
- Low Pressure Setting at 50 psi

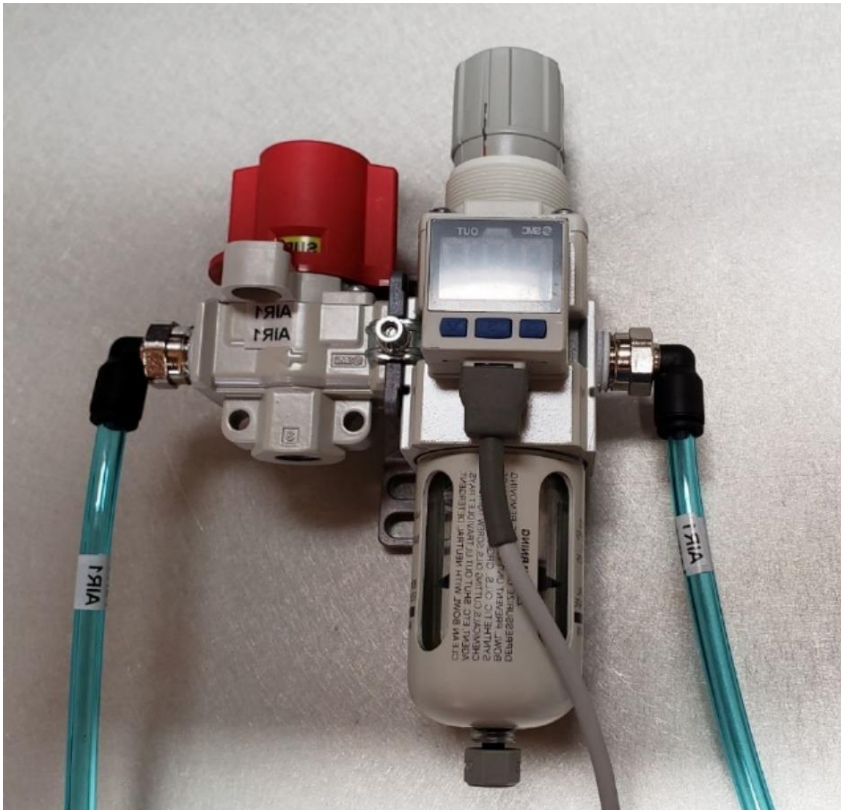


Figure 7: RPA FRL

1.6 RPA IO and Power Distribution Enclosure

This enclosure is housing the following main items:

1.6.1 Printer Interface Boards

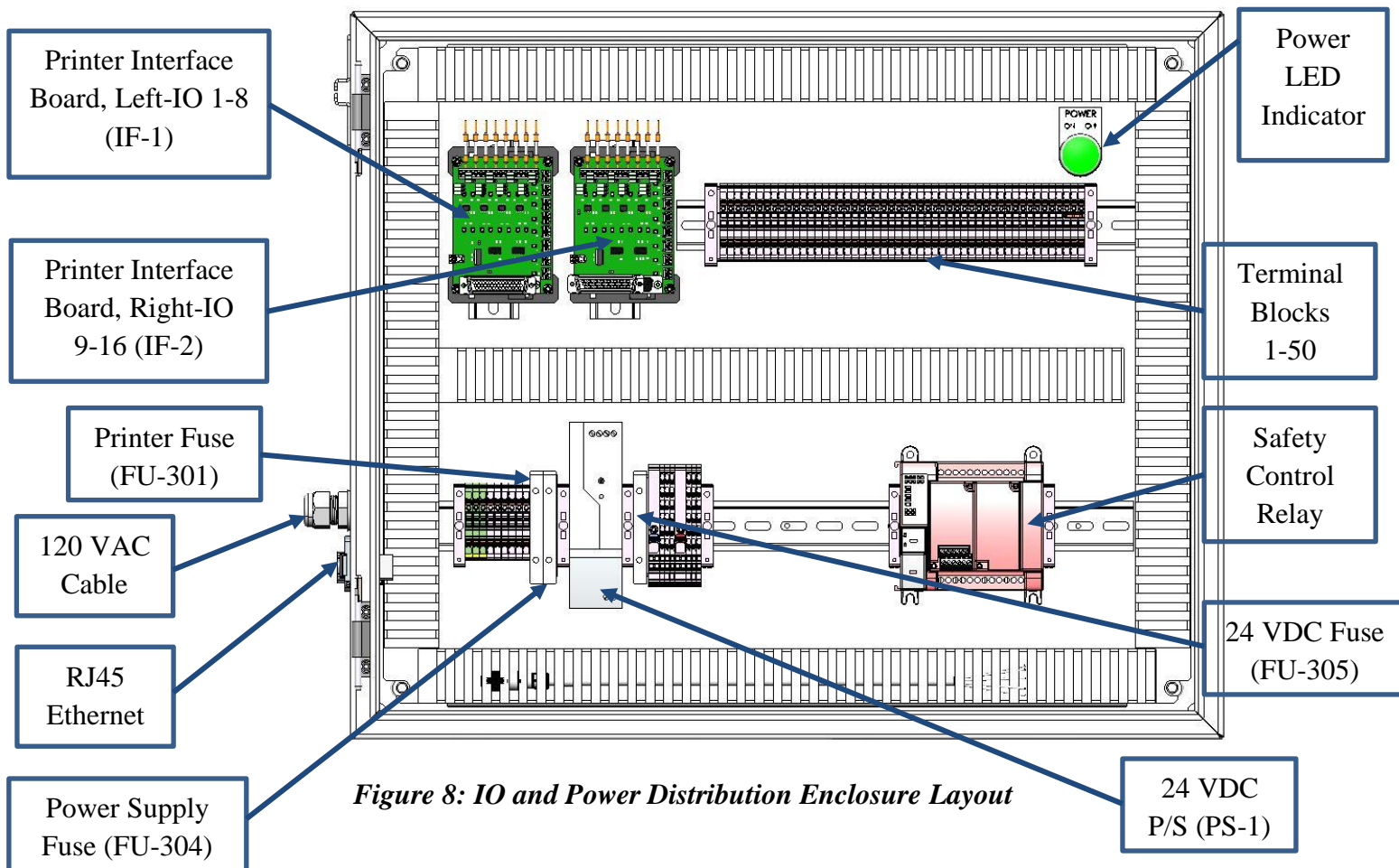
There are two Interface Boards: IF-1 and IF-2

1.6.2 24 VDC Power Supply (PS-1)

1.6.3 Fuses

- 120VAC Printer Fuse (FU-301): 6A, ¼" x 1.25"
- 120VAC Power Supply Fuse (FU-304): 1A, ¼" x 1.25"
- 24VDC Fuse (FU-305): 2A, ¼" x 1.25"

1.6.4 Safety Control Module



1.7 Printer IO Interface Board (Left, IF-1, IO 1 - 8)

This IF-1 IO Interface is mainly for Robot IOs interface

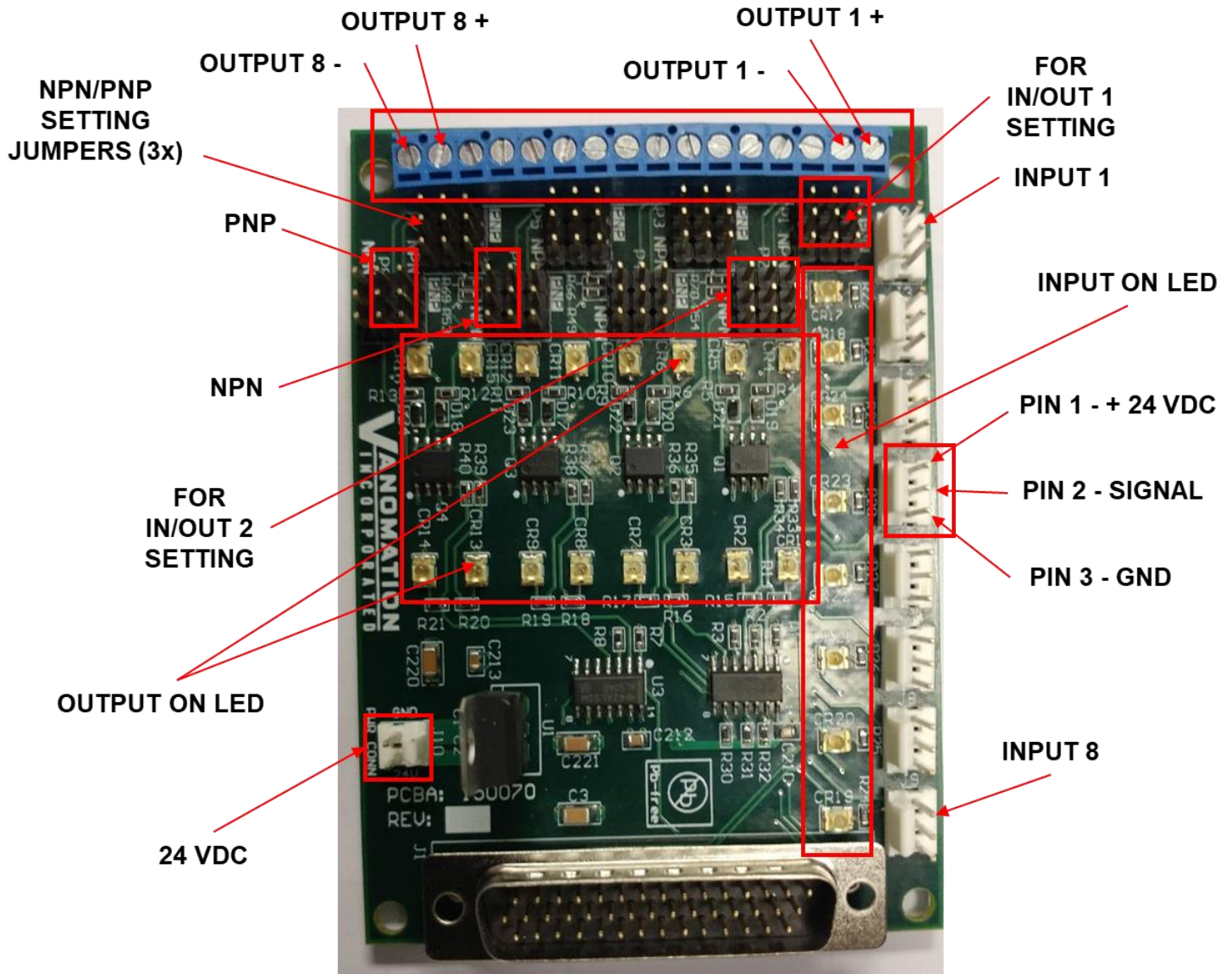


Figure 9: Printer IO Interface, IF-1 (IOs 1 - 8)

1.8 Printer IO Interface Board (Right, IF-2, IO 9 - 16)

This IF-2 IO Interface is mainly for Operator Control Panel and Device IOs interface

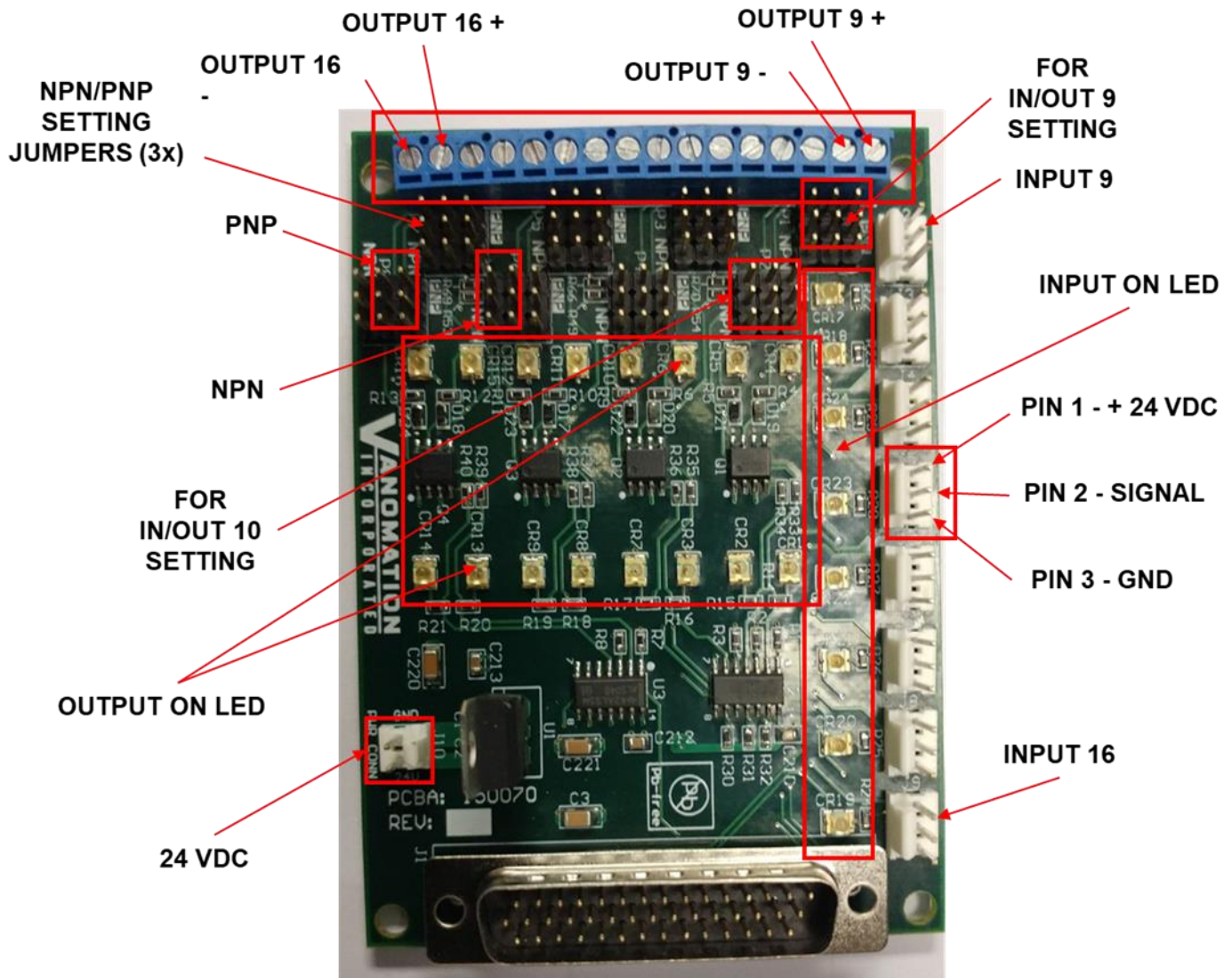


Figure 10: Printer IO Interface, IF-2 (IOs 9 - 16)

1.9 IO List

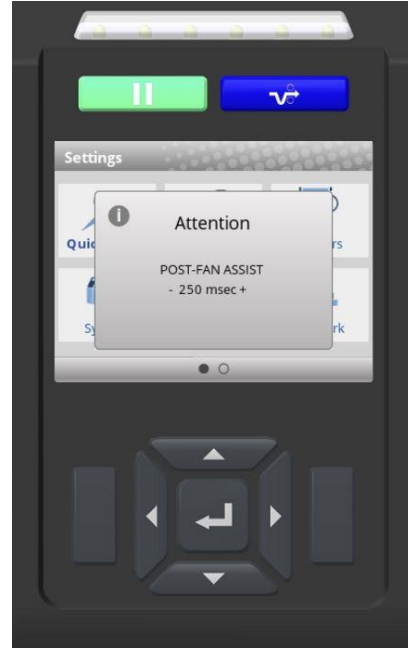
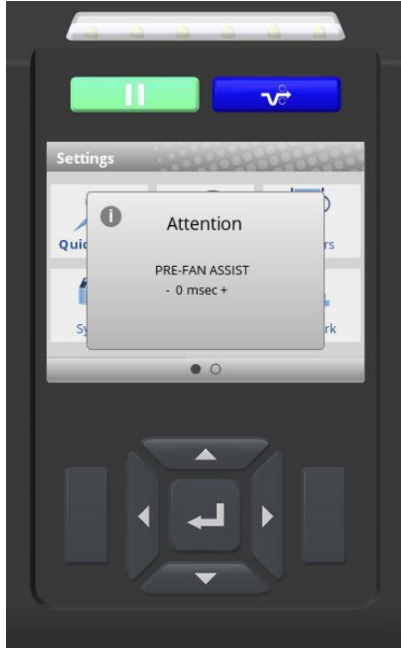
INPUTS	DEFINITION	NAME	TB
1	atHome - from Robot	PIP1	1
2	RobotReady - from Robot	PIP2	2
3	atPick - from Robot	PIP3	3
4	atPLace- from Robot	PIP4	4
5	PalletReady - from PLC	PIP5	5
6	AirPressure	PIP6	6
7	RobotError - from Robot	PIP7	7
8	RobotJobDone - from Robot	PIP8	8
9	Lock Sensor (OFF - Locked)	PIP9	9
10	2-4Labels - from PLC	PIP10	10
11	Printer Slide Lock Toggle Switch	PIP11	11
12	Online/Offline Toggle Switch	PIP12	12
13	LabelLow	PIP13	13
14	STOP Toggle Switch	PIP14	14
15	START Toggle Switch	PIP15	15
16	Auto/Manual Toggle Switch	PIP16	16
OUTPUTS	DEFINITION		
1	toHome - to Robot to go Home	POP1	17
2	ReadyToPrint - to Robot	POP2	18
3	StartRobotJob - to Robot	POP3	19
4	2-4Labels - to Robot	POP4	20
5	NOT USED	POP5	21
6	System Error--To PLC	POP6	22
7	NOT USED	POP7	23
8	InitializeRobot - To Robot	POP8	24
9	FanAssist	POP9	25
10	Lock (ON=Lock, OFF=Unlock)	POP10	26
11	Blue Status Light	POP11	27
12	Online SW Button Light	POP12	28
13	Lock SW Button Light	POP13	29
14	Green Status Light	POP14	30
15	Red Status Light	POP15	31
16	Amber Status Light	POP16	32
	NOT USED		33
RELAY-1-COM	PLC COM	RCOM1	34
RELAY-2-COM	PLC COM	RCOM2	35
RELAY-3-COM	PLC COM	RCOM3	36
RELAY-4-COM	PLC COM	RCOM4	37
		RNO1 (NC)	38
		RNO2 (NC)	39
		RNO3 (NC)	40
		RNO4 (NC)	41
RELAY-1	JobDone - to PLC	RNO1 (NO)	42
RELAY-2	Online/Offline - to PLC	RNO2 (NO)	43
RELAY-3	RobotHome - to PLC	RNO3 (NO)	44
RELAY-4	Auto Mode - to PLC	RNO4 (NO)	45
	Robot Cell Safe - to PLC		46
	PalletReady - from PLC		47
	2-4Labels - from PLC		48
	COM (0 VDC) - from PLC		49
	NOT USED		50

1.10 Time Delay Menu on T8306 Printer

To access this menu to adjust the Fan Assist Timing, follow these instructions:

- Take Printer Offline by either toggling PAUSE button on the Printer Display or ONLINE/OFFLINE button
- Make sure Printer is Offline. ONLINE/OFFLINE button light or Amber Status Light is OFF.
- Press ENTER and DOWN keys together
- First menu will be Pre-Delay
- Second Menu will be Post Delay
- To change the value:
 - Soft Right key: Increment by 10
 - Right Arrow key: Increment by 1
 - Soft Left key: Decrement by 10
 - Left Arrow key: Decrement by 1
- Press Enter to Exit this menu

NOTE: For the Post-Delay to work, Pre-Delay must be zero.



1.11 RPA IO Test Menu on T8306 Printer

To access this menu to test all the printer IOs (16 inputs, 16 outputs and 4 relay out puts - 17 to 20), follow these instructions:

- Take Printer Offline by either toggling PAUSE button on the Printer Display or ONLINE/OFFLINE button
- Make sure Printer is Offline. ONLINE/OFFLINE button light or Amber Status Light is OFF.
- Press SOFT LEFT and UP keys together
- First menu will be Pre-Delay
- Second Menu will be Post Delay
- To change the value:
 - Soft Right key: Increment by 10
 - Right Arrow key: Increment by 1
 - Soft Left key: Decrement by 10
 - Left Arrow key: Decrement by 1
- Press Enter to Exit this menu

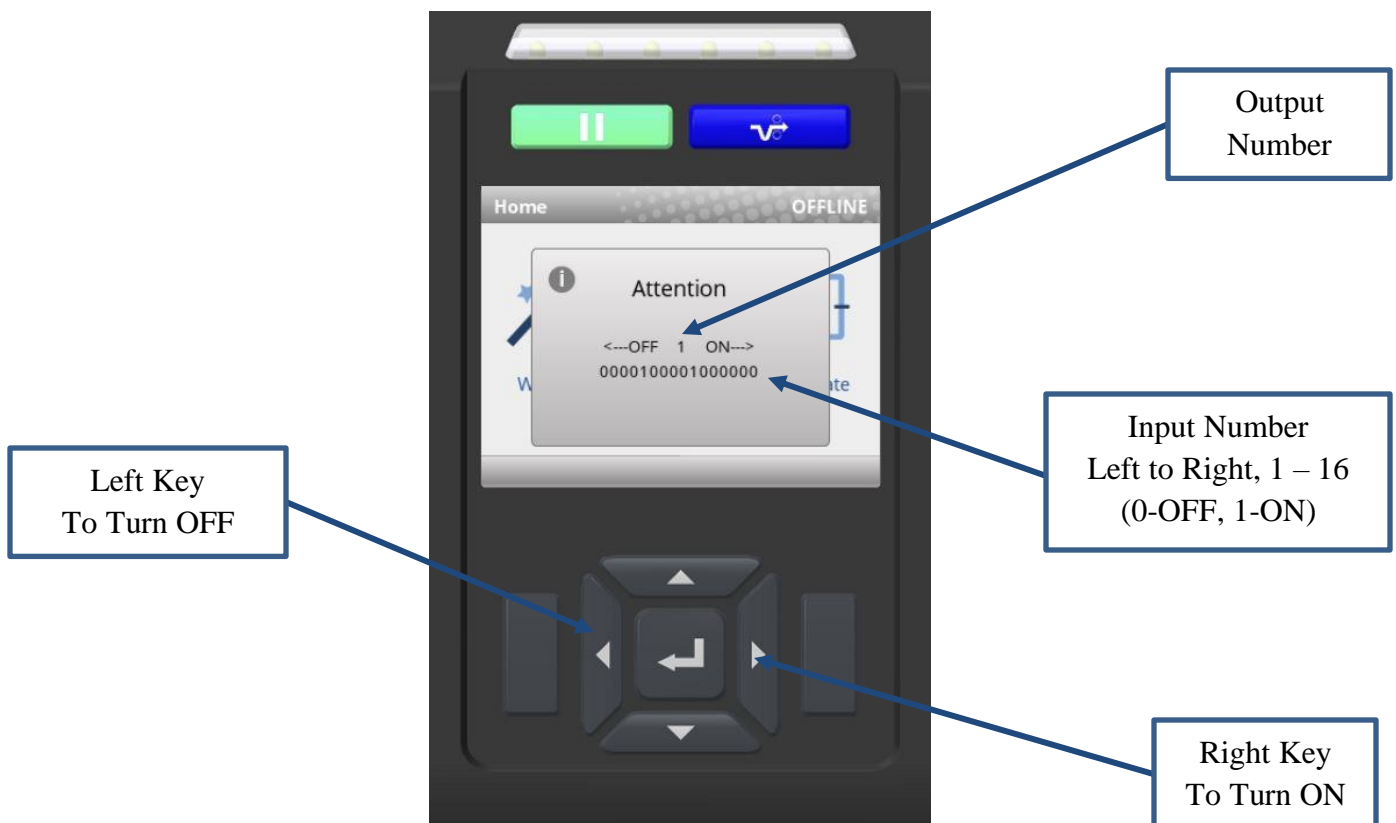


Figure 11: Test Mode Menu

1.12 System Startup

1.12.1 RPA Power ON

1. Make sure Mode Switch is in Manual Position
2. Make sure the printer is slid out
3. Turn ON Green Power Switch on the Front Control Panel.
4. Turn ON Power Switch on the Robot Controller
5. When the system ONLINE (Online/Offline Light is ON), press FEED on the Printer Control Panel to feed a label out to make sure the feeding of Top of Form is working properly. **This is a MUST.**
6. On Robot Pendant, select I/F Panel to access Robot HMI Screen

1.12.2 Running in Manual Mode

This Manual Mode is used to print labels manually in events of the robot is out of commission.

1. Turn Mode Switch to MANUAL
2. Make Sure Printer Lock is OFF. If it is not OFF then Press Lock Switch to unlock
3. Make sure the printer is Online. If not, press Online/Offline Button or Press PAUSE Button on the Printer Panel.
4. Blue Light is ON when there is DATA in the Printer Buffer
5. Press START Button to print one label at a time till Blue light is OFF

1.12.3 Running in Auto Mode

This Auto Mode is used to print and apply labels automatically using the robot.

1. Make Sure the Robot Controller is ON and HMI Pendant shows no Errors
2. Turn Mode Switch to AUTO. Green Status Light should be flashing once every two seconds
3. Slide Printer inside and close Printer Door. Door Interlock should be Green
4. Make Sure Printer Lock is ON. If it is not On then press Printer Lock Switch to lock
5. Make Sure the printer is Online. If not, press Online/Offline Button or Press PAUSE Button on the Printer Panel.
6. Follow Instructions on the Printer Display
7. When Printer ONLINE and Locked. Display will show “Waiting Robot Ready. Initializing Robot”



Figure 12: Waiting Robot Ready

8. If Robot Controller is ON and Ready, then the Green Status Light will flash every second and Printer Control Display will show “Waiting to START...”

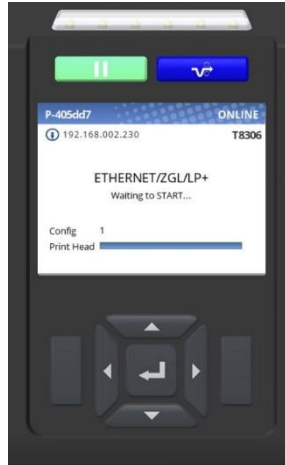


Figure 13: Waiting to START

9. Press START Button to Start the Auto Mode
10. Green Status Light will show solid and now system is ready in Auto Mode. Refer to Figure 14: Printer in AUTO MODE below.

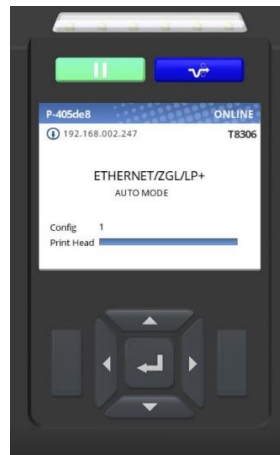


Figure 14: Printer in AUTO MODE

NOTE: Blue Status Light will be ON when there is DATA in the Printer Buffer

2 Light Tower Definition

The purpose of the light tower is to notify the operator about the RPA status:

RED Light:

- ON during the following conditions:
 - Printer Error
 - System Error
- BLINKING:
 - Robot Error

AMBER Light:

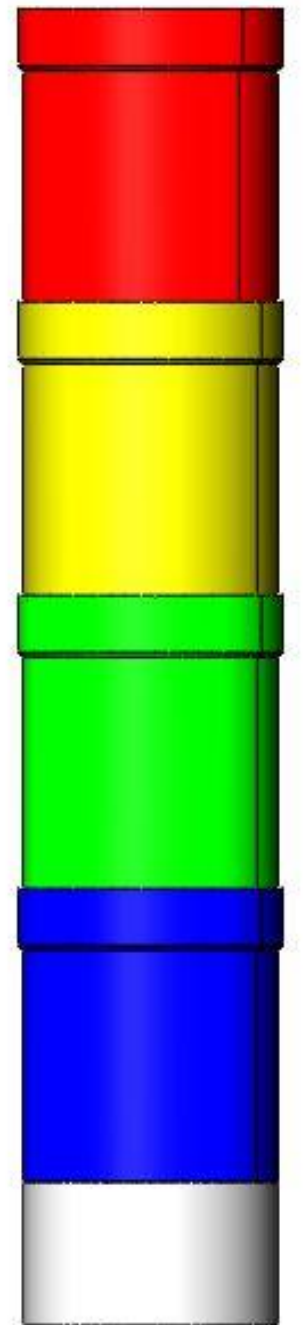
- ON during the following conditions:
 - Printer is ONLINE
- OFF:
 - Printer is OFFLINE
- Flashing during the following conditions:
 - Warning: Label Low

GREEN Light:

- ON during the following conditions:
 - RPA in Auto Mode
- BLINKING every two seconds:
 - Waiting for Robot Ready
- BLINKING every second:
 - Waiting for Start Button
- OFF:
 - RPA in Manual Mode

BLUE Light:

- ON during the following conditions:
 - Data in Printer Buffer
- OFF:
 - Printer Data Buffer is Clear



3 Emergency Stop/Safety Interlocks and Error Recovery Mode

There are 2 Emergency-Stop buttons: One on the front panel of RPA and other is on the robot pendant. There are two Safety Door Interlocks: One on the right door and other is on bottom left printer door. Pressing any E-Stop or opening any safety interlock door will cease robot motion, turn robot motor power off, and allow access to the inside of the RPA cell. Twist the E-Stop clockwise to release or close all doors.

3.1 E-Stop Buttons and Safety Interlocks

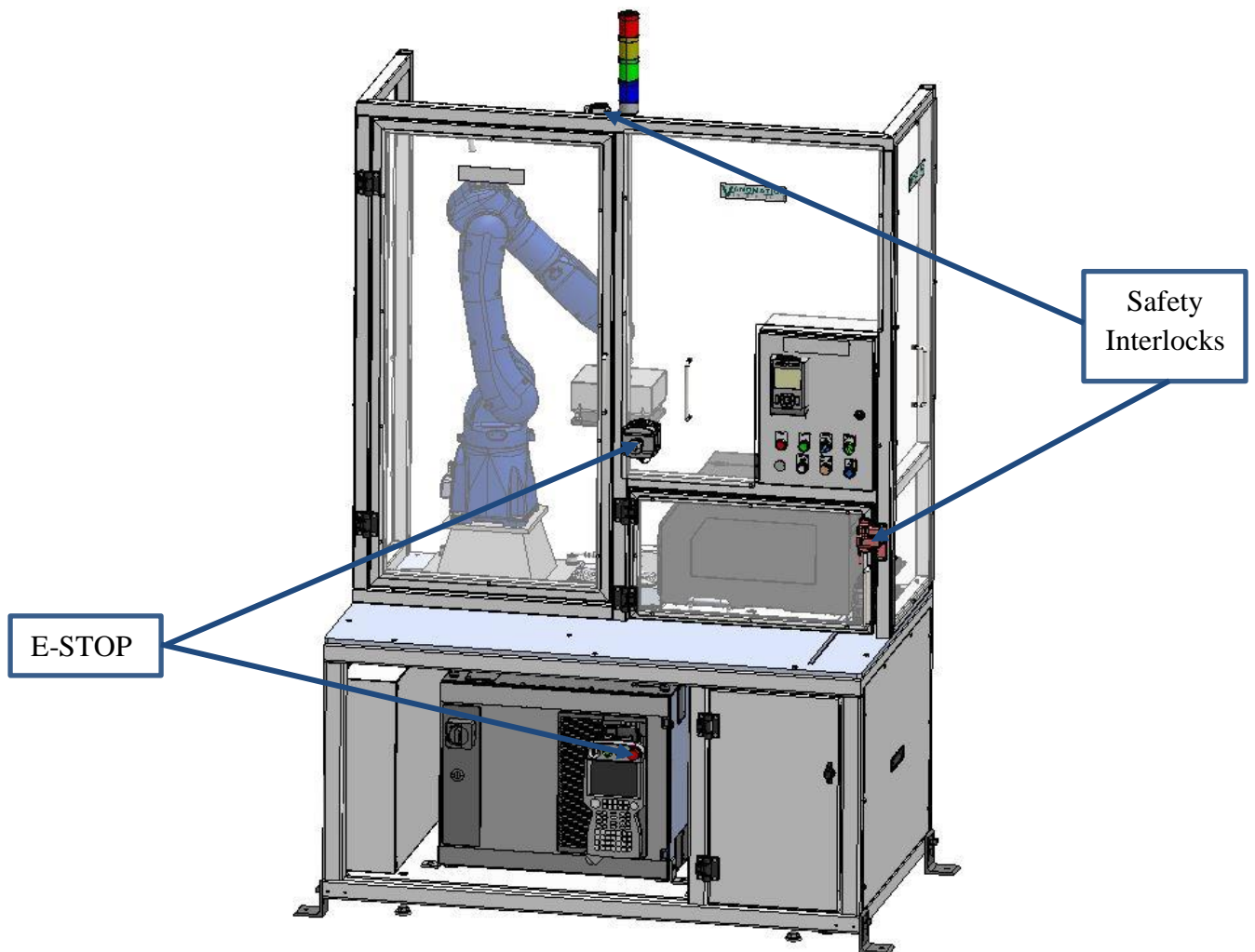


Figure 15: E-Stops and Safety Interlocks

3.2 Resume Operation from an E-STOP or System Error

To resume operation after an E-Stop or System Error, perform the following steps:

1. Reset the E-STOP (with 1/4 twist clockwise of the red button - The red light on the light tower will turn off and the amber light of the light tower will turn on.
2. Toggle to Manual Mode
3. Go thru Manual Mode Procedure. Refer to [Running in Manual Mode](#)
4. Make sure to print all labels manually till Blue Status Light is OFF.
5. Toggle to Auto Mode.
6. Refer to [Running in Auto Mode](#) to put system back to normal operation

4 Loading Printer Labels

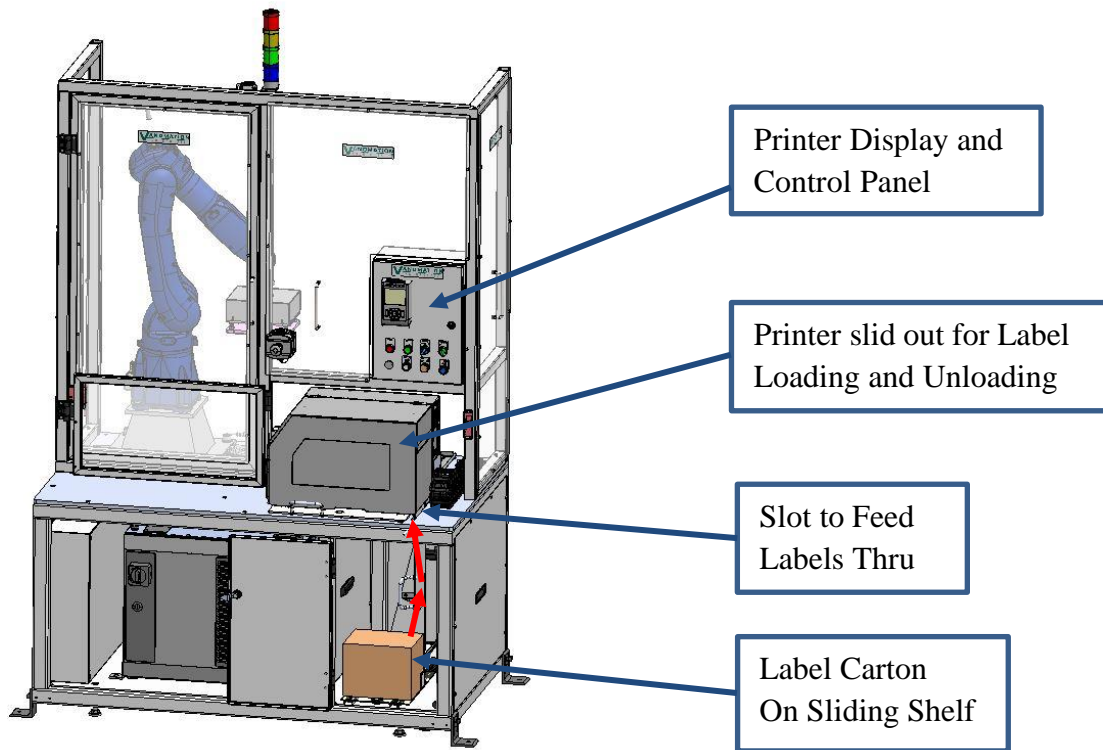


Figure 16: Loading Labels

Refer to the Figure 16: Loading Labels and the corresponding instructions. The red arrows indicate the direction of the labels flow.

1. Toggle RPA to Manual Mode
2. Take Printer Offline
3. Unlock Printer Slide, if it is locked
4. Open Printer Door
5. Load Labels. Refer Printer Manual for more details on how to load labels inside printer
6. Take Printer Online by pressing Online/Offline button or Pause Blue button on the control panel
7. Feed a few labels by pressing FEED button on the Printer Control Panel to make sure the label is fed properly to the Top of Form

5 RPA Settings

5.1 Time Delay (on Robot Pendant)

- 175 sec

5.2 Air Pressure (On Pressure Regulator)

- 65 PSI.

Note: Low Pressure Sensor will be ON if pressure is below 50 PSI

5.3 Printer Speed (On Printer Media Menu)

- 10 IPS

5.4 Pressure Blocks (On Printer)

- Left Block: 30
- Right Block: 120
- Refer to Figure below for settings

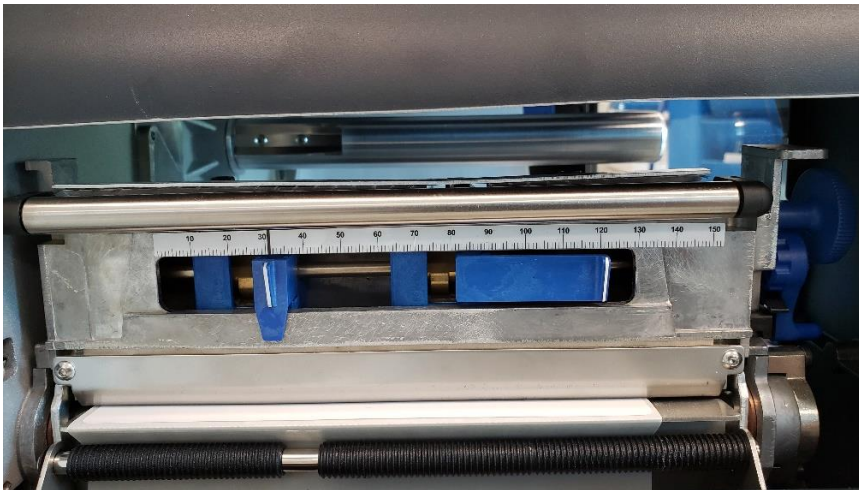


Figure 17: Pressure Block Settings

5.5 Pre-Delay (On RPA Menu)

- 0 Sec

5.6 Post-Delay (On RPA Menu)

- 250 Sec

6 Serial Numbers

1. GP 7 Robot:
2. YRC1000 Controller:
3. T8306 Printer: