

RPA Installation Manual

Software Installation

1. Place the included CD into the control computer's CD drive.
2. Navigate to and double click on file labeled *setup.exe*.
3. Click "Next" or navigate to the desired directory for software installation and then select "Next".
4. Read through the license agreement. When finished, select the "I accept the License Agreement" option and press "Next".
5. The 'Start Installation' window will appear. Press "Next" to begin installation.
6. When the installation is complete, press the finish button.

Note: This installation manual and other documentation are also included on the CD.

Hardware Set-Up

Figure 1 shows the relationship between the mechanical mounting features and the beam pointing coordinate frame.

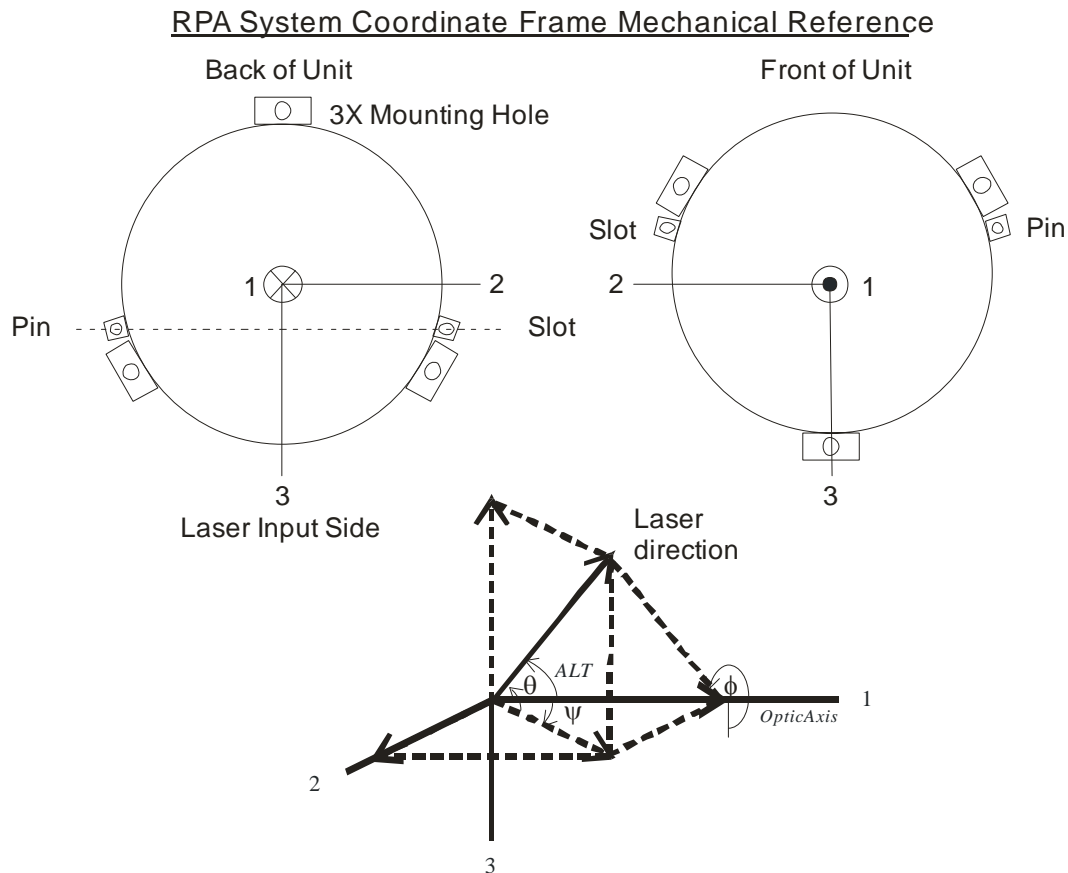


Figure 1 – RPA System Coordinate Frame Relationship to Mechanical Mounting Features

Mechanical interface drawings are attached to the back of this manual. Refer to the appropriate drawing for the RPA system being integrated.

System Description	Mechanical Interface Drawing
RP-25F	1-1479-2
RP-25S	1-1480-2
RP-50	1-1462-3

Figure 2 shows the system connection diagram.

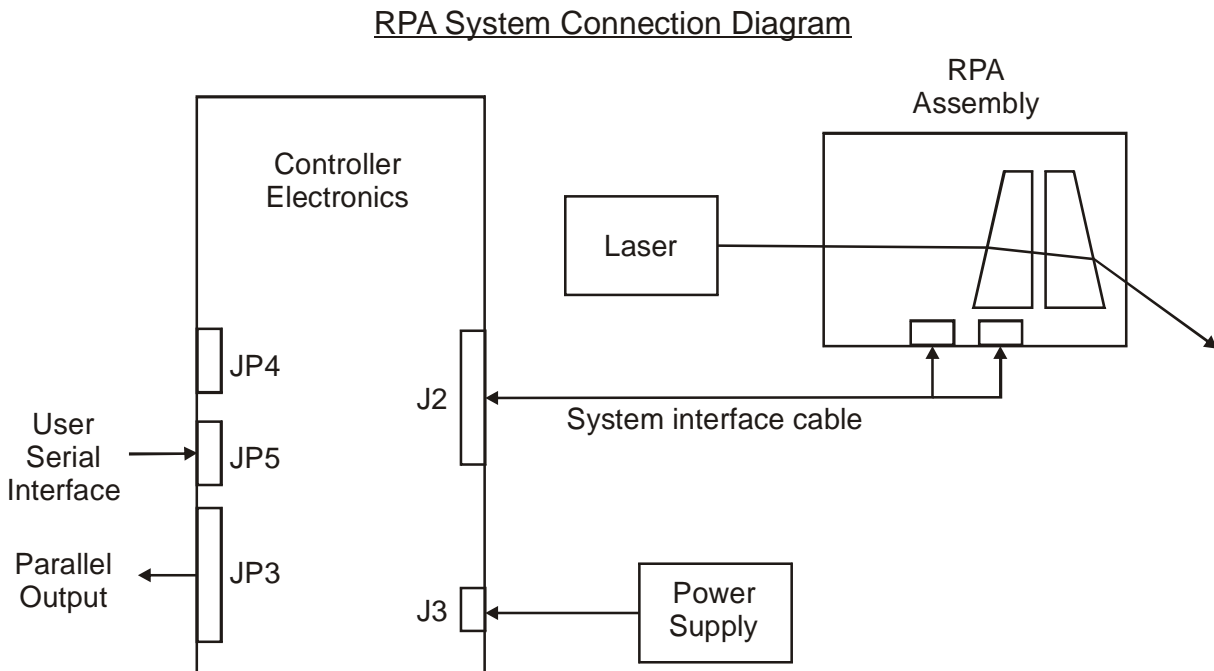


Figure 2 – RPA System Connection Diagram

An RPA and the supporting control electronics are a mated set. This is because information relative to the relationship of the prism orientation to the encoder reference mark, as well as information describing pointing angles as a function of prism relationship, is contained in memory resident on the controller board. The systems are clearly identified by the same serial number that is on both the optical hardware and controller electronics.

1. A silver cable has been included to connect the RPA to the controller electronics. Connect the 25-pin connector to the electronics chassis (J2).
2. Connect each of the 15-pin connectors to the two outlets on the RPA assembly.
3. Connect a serial cable from the user serial port (JP5) of the controller electronics to the serial port on the computer via the supplied serial interface cable.
4. Plug in power for the controller electronics (J3). A mating connector was supplied with the controller electronics and needs to be wired to the power source. The wiring of the power connector is contained in the RPA Controller Technical Description document, which is also provided on the included CD.
5. Power on the controller electronics.

GUI Usage

1. Open the RPA Test Panel by clicking on the Start Menu and locating the shortcut at the end of the 'All Programs' menu.
2. The window depicted in Figure 3 below will automatically open. Use the arrow next to the RPA ComPort field to view all available ComPorts on the computer. (Note: This may take a minute for the computer to identify all available ports – please be patient.) Select the ComPort connected to the RPA's electronics chassis. The Debug Comport is only used during factory calibration and does not need to be configured. Press the 'OK' button when complete.

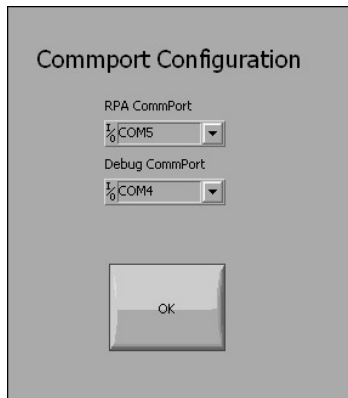


Figure 3 – ComPort selection window

3. The command window depicted in Figure 4 will automatically open. Each section of the GUI is described in following subparagraphs.

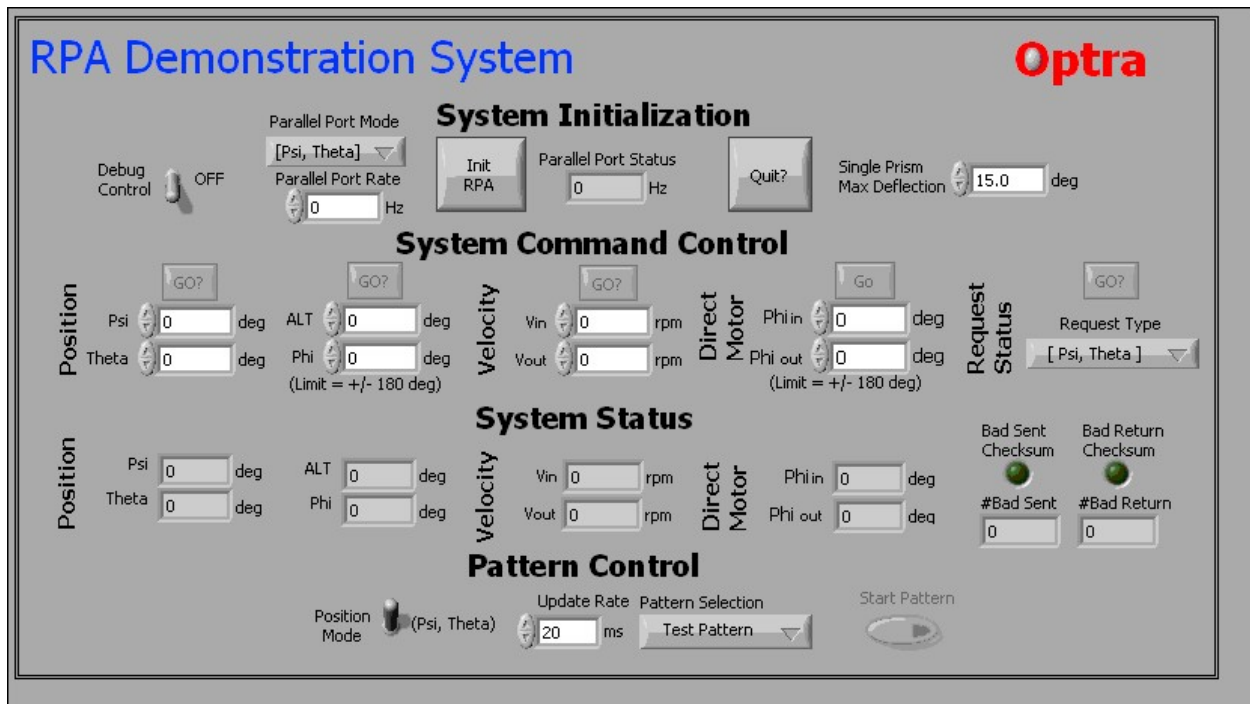


Figure 4 – RPA command window

- a. **System Initialization** - Initially, all controls will be disabled (as indicated by their faded grey color), except for the 'InitRPA' and 'Quit?' options. The user should configure the RPA's Parallel Port output (See the RPA Controller Technical Description document for more information on the Parallel Port) by selecting the desired Parallel Port Mode and Parallel Port Rate (Note: A Parallel Port Rate of zero will disable the RPA's Parallel Port output). When complete, select 'InitRPA' to initialize the system. The system will go through an initialization routine lasting approximately 30 seconds (you'll notice the prisms moving). When complete, the achieved Parallel Port Rate is updated and all controls will be enabled.

Lastly, although the RPA electronics and prism assembly are a mated set, this GUI is not specific to any delivered mated set so update the Single Prism Max Deflection of the system. This information is only used to tailor the Patterns (in the Pattern Control section) for your specific prism assembly.

- b. **System Command Control** - There are a number of System Command commands that can be used to control the system; position, velocity and prism position. In each case, the desired commands for each prism or motor should be typed into the given fields in the appropriate units. Once the desired command has been entered, press the 'Go' button to execute it. Notice that the corresponding field in the System Status section is updated based on information received from RPA to the command. Note that the response information is always "one old" – the RPA reads the status of the prisms **prior to** outputting the new command. Waiting for the prisms to achieve their commands would reduce overall system bandwidth.

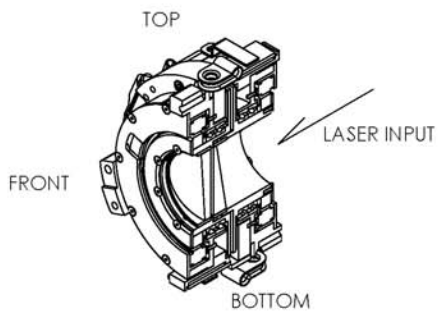
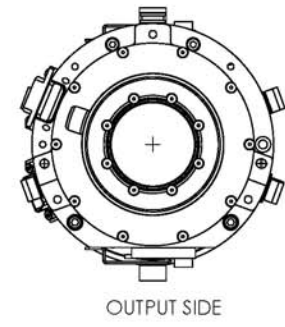
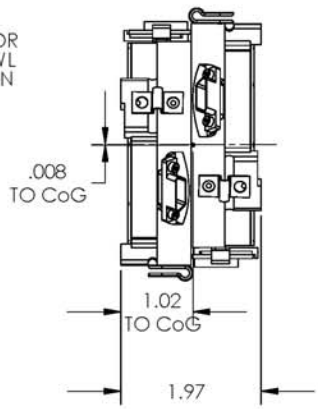
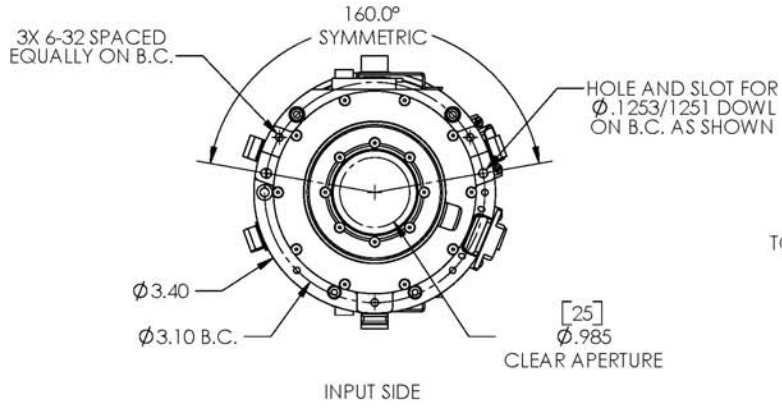
The user can also request status information only (no command) by selecting the status Request Type and pressing the 'Go' button. The corresponding request type in the System Status will be updated with the information.

- c. **System Status** – This section reflects system status information received in response to a command message made by pressing a 'Go' button in the System Command section. Message checksum information is also displayed reflecting any sent or received messages that had a checksum not matching the message information.
- d. **Pattern Control** - The system can execute a given pattern (a sequential set of position commands) rather than a single command using the Pattern Control portion of the command window. The user should configure the Position Mode, Update Rate, and select a pattern from the pull down list. When complete, press Start Pattern to begin pattern generation. To stop executing the pattern, flip the Start Pattern to OFF. When a pattern is selected, it is configured to the capabilities of the RPA using the Single Prism Max Deflection information in the System Initialization section. The user should verify that this is configured properly.

4. When the user is done using the system, it should be disabled by selecting the 'Quit?' button in the System Mode Control section.

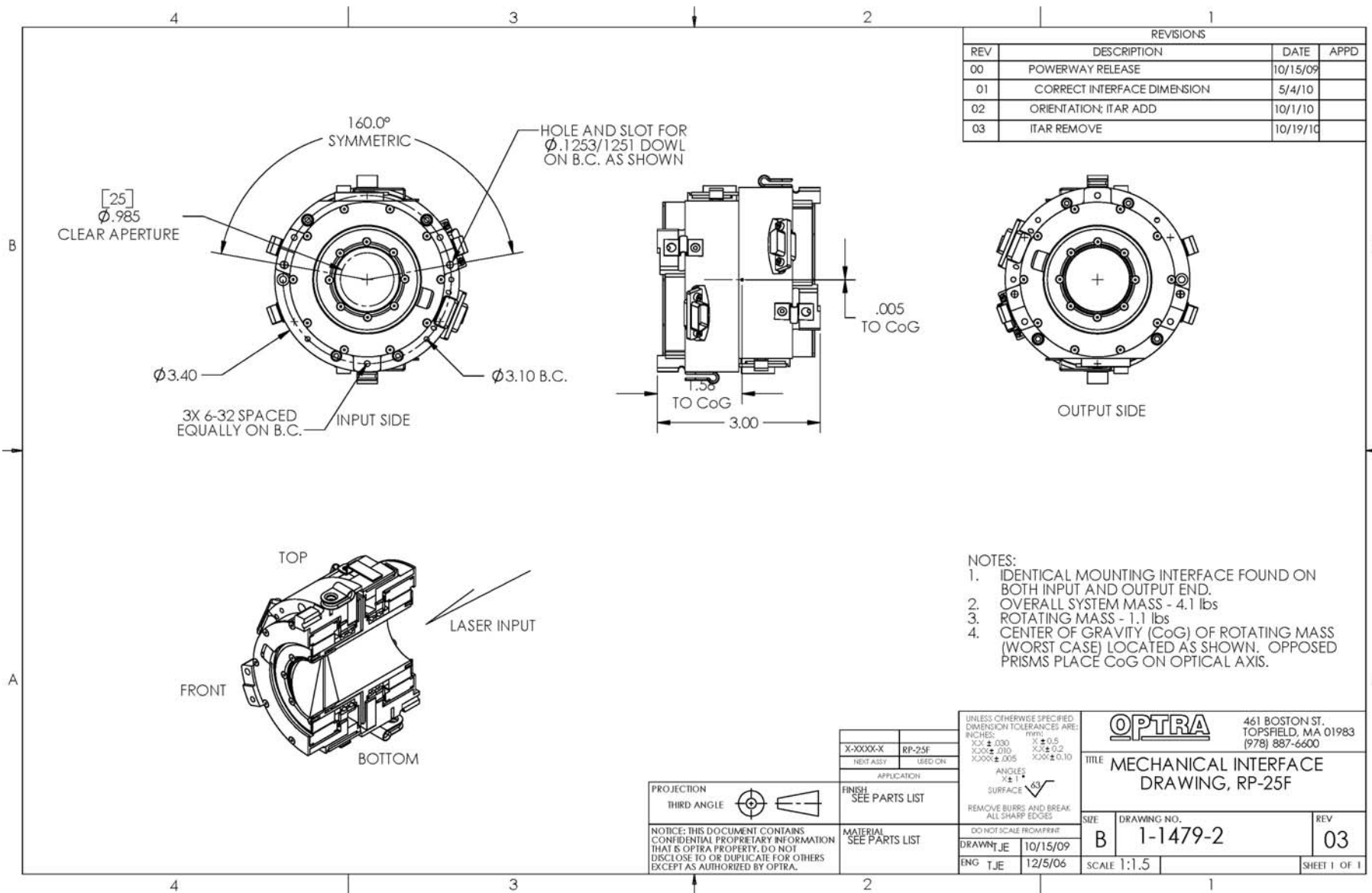
For more information on the message structure used to communicate with the RPA, refer to the RPA Controller Technical Description document included on the CD.

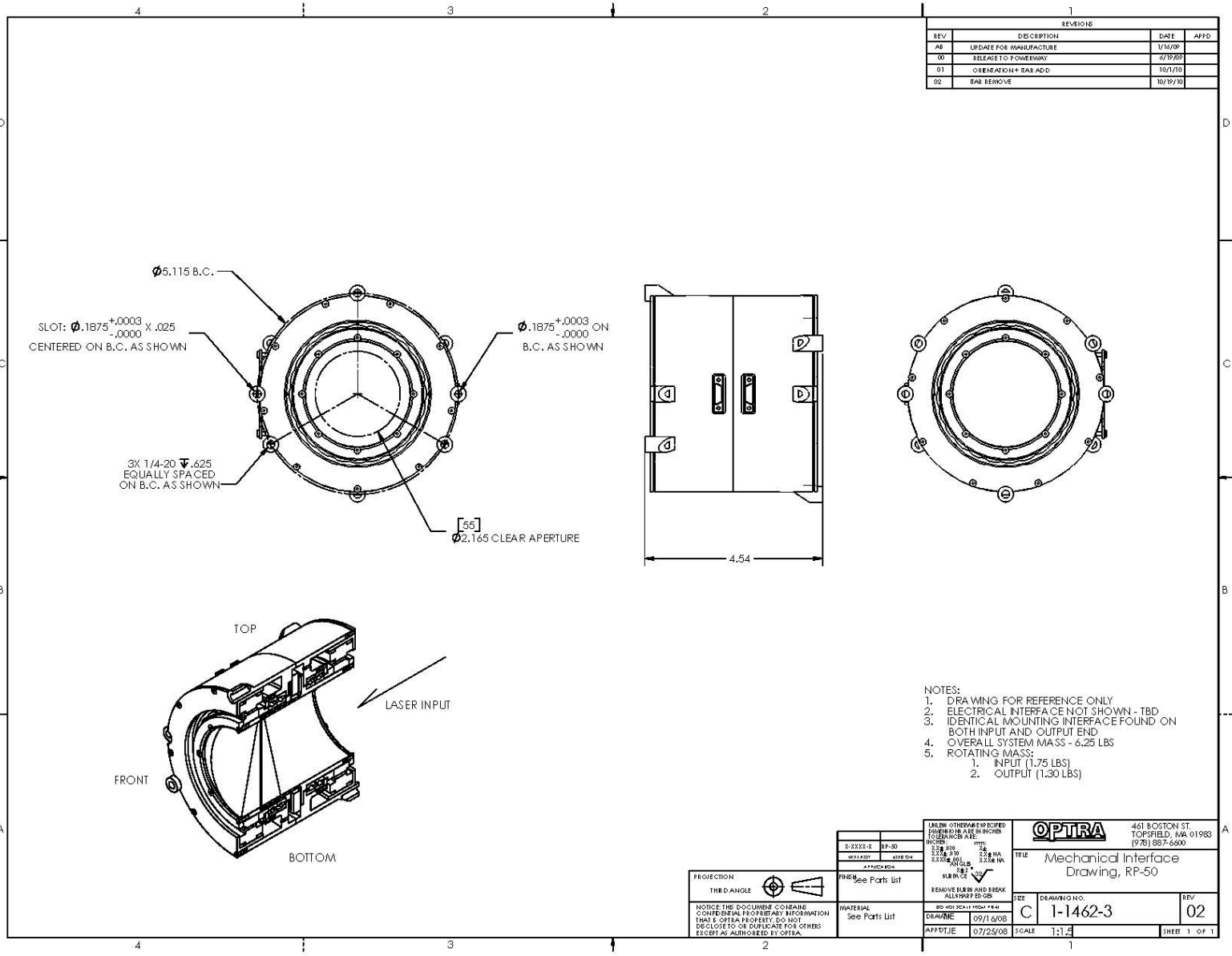
REVISIONS			
REV	DESCRIPTION	DATE	APPD
00	RELEASE TO POWERWAY	10/20/09	
01	CORRECT INTERFACE DIMENSION	5/4/10	
02	ORIENTATION, ITAR ADD	10/1/10	
03	ITAR REMOVE	10/19/10	



- NOTES:
1. IDENTICAL MOUNTING INTERFACE FOUND ON BOTH INPUT AND OUTPUT END.
 2. OVERALL SYSTEM MASS - 2.25 lbs
 3. ROTATING MASS - 0.72 lbs
 4. CENTER OF GRAVITY (CoG) OF ROTATING MASS (WORST CASE) LOCATED AS SHOWN. OPPOSED PRISMS PLACE CoG ON OPTICAL AXIS.

PROJECTION THIRD ANGLE		X-XXXX-X RP-255		UNLESS OTHERWISE SPECIFIED DIMENSION TOLERANCES ARE: INCHES: .001 ± .003 .002 ± .010 .005 ± .005 MILLIMETERS: .05 ± .05 .02 ± .02 .10 ± .10		OPTRA 461 BOSTON ST. TOPSFIELD, MA 01983 (978) 887-6600	
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MATERIAL SEE PARTS LIST		DO NOT SCALE FROM PRINT DRAWN: TJE 8/31/06		REMOVE BURRS AND BREAK ALL SHARP EDGES		SIZE B 1-1480-2	
		ENG: TJE 8/21/06		SCALE 1:1.5		REV 03	
						SHEET 1 OF 1	





REVISIONS			
REV	DESCRIPTION	DATE	APPD
A0	UPDATE FOR MANUFACTURE	1/16/09	
00	RELEASE TO POWERWAY	4/19/09	
01	ORIENTATION BAR ADD	10/17/10	
02	BAR REMOVE	10/19/10	

- NOTES:
1. DRAWING FOR REFERENCE ONLY
 2. ELECTRICAL INTERFACE NOT SHOWN - TBD
 3. IDENTICAL MOUNTING INTERFACE FOUND ON BOTH INPUT AND OUTPUT END
 4. OVERALL SYSTEM MASS - 6.25 LBS
 5. ROTATING MASS:
 1. INPUT (1.75 LBS)
 2. OUTPUT (1.30 LBS)

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			FINISH See Parts List	TITLE Mechanical Interface Drawing, RP-50
MATERIAL See Parts List			REMOVE BURRS AND BREAK ALL SHARP EDGES	SIZE C DRAWING NO. 1-1462-3 REV 02
DRAWING 09/16/08			APPT/EJ 07/25/08	SCALE 1:1.5 SHEET 1 OF 1