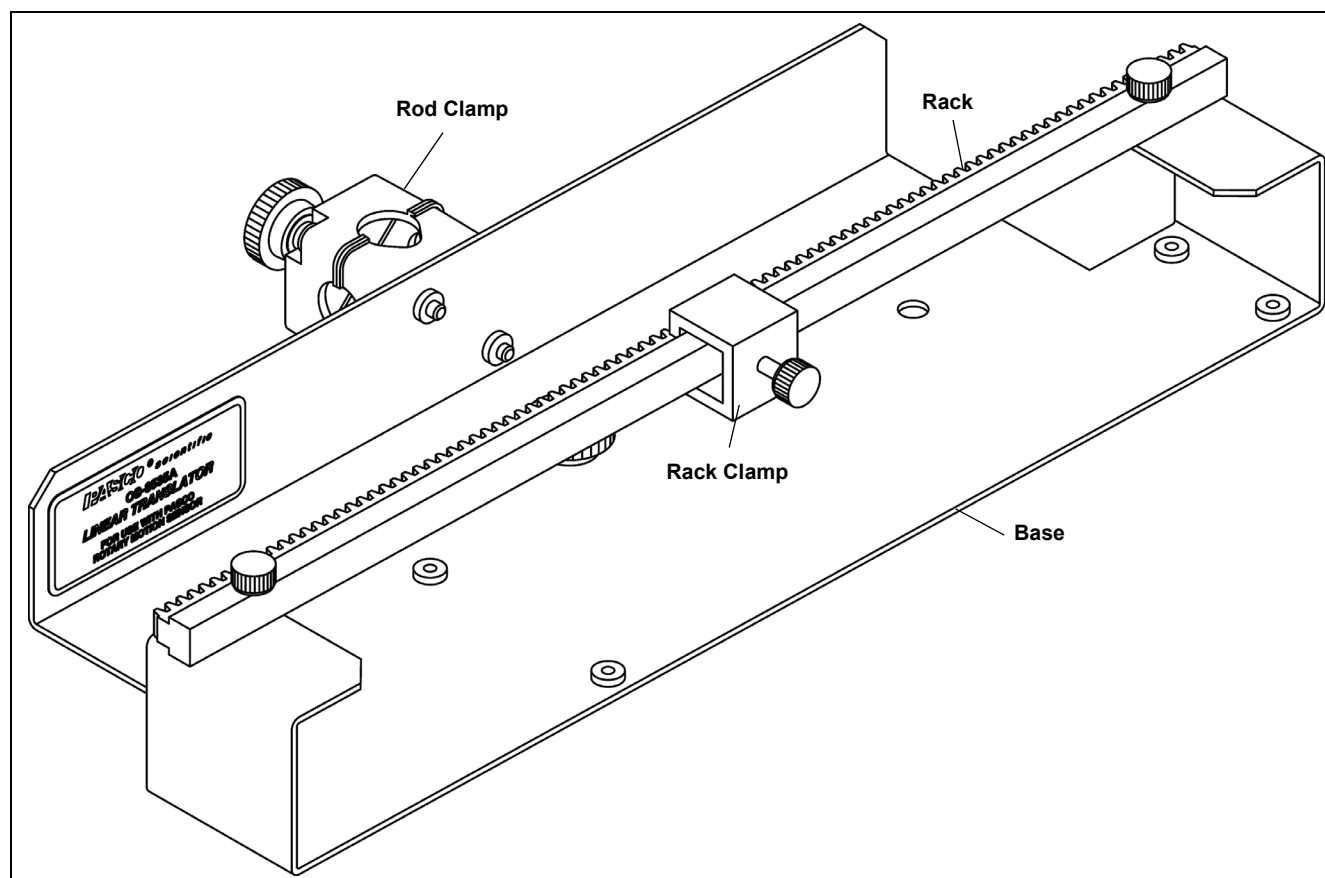




Linear Translator

For the Basic Optics System

OS-8535A



Linear Translator (OS-8535A)

Included Item	Quantity
Linear Translator	1

Recommended Items*
PASCO 60 cm Optics Track (OS-8541)
PASCO 1.2 m Optics Track (OS-8508)

*See the PASCO catalog or web site at
WWW.PASCO.COM

Introduction

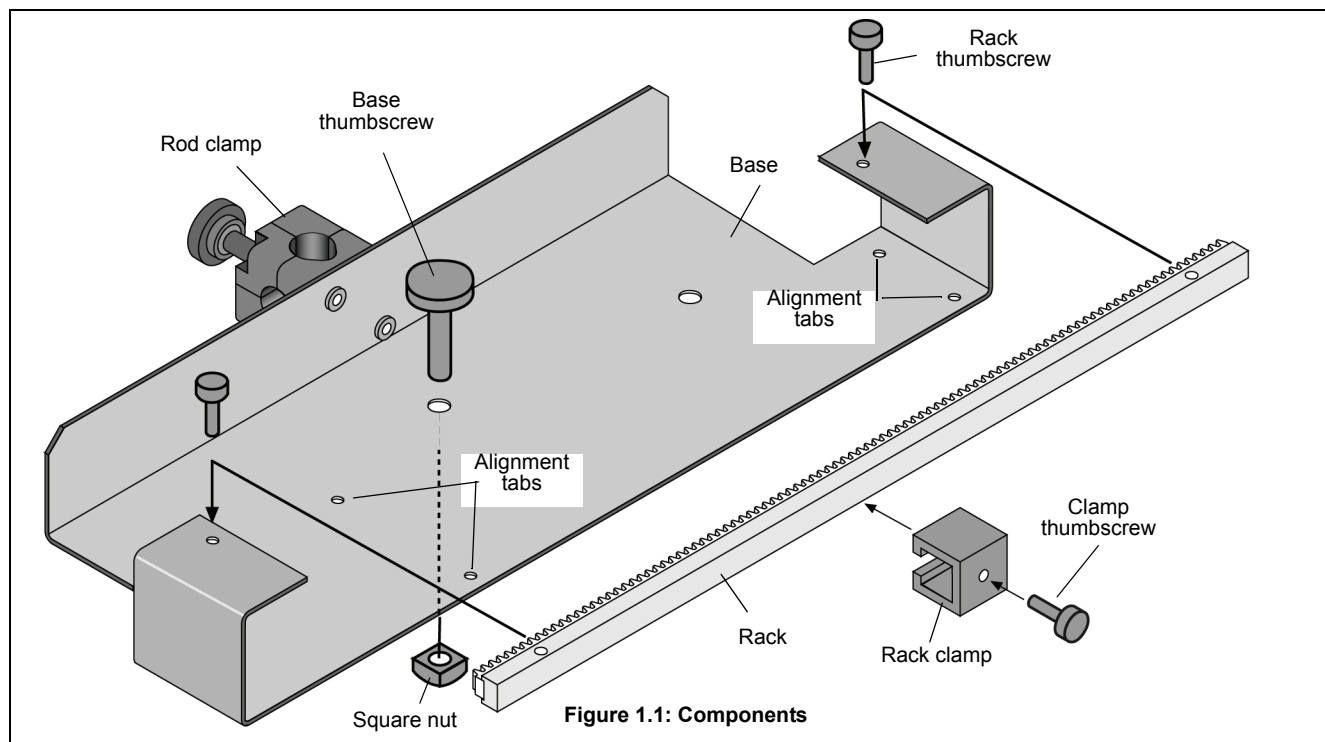
The PASCO OS-8535A Linear Translator is designed to be mounted on an Optics Bench (such as the one in the OS-8515 Basic Optics System). The Linear Translator can also be mounted on a rod up to 0.5 inch (12 mm) diameter.

Description

The Linear Translator consists of a base with mounting hardware and an attached rod clamp, a rack, and a rack clamp. The hole in the base allows it to be stored on a peg. The mounting hardware on the base consists of a thumbscrew and a square nut. The nut fits into the T-slot in the center of a PASCO Optics Bench (such as OS-8508 that is part of the OS-8515 Basic Optics System).

The rack is attached to the top of the base with two thumbscrews. The rack is designed to fit inside the T-slot on the side the PASCO Rotary Motion Sensor (such as the PS-2103A PASPORT sensor or the CI-6538 ScienceWorkshop sensor). The teeth on the rack engage a gear inside the Rotary Motion Sensor, causing the gear to rotate when the Rotary Motion Sensor moves along the rack. The Rotary Motion Sensor measures its linear position along the rack.

The rack clamp is attached to the back of the rack with a thumbscrew. The clamp sets the initial or final position of the Rotary Motion Sensor.



Mounting the Linear Translator on the Optics Bench

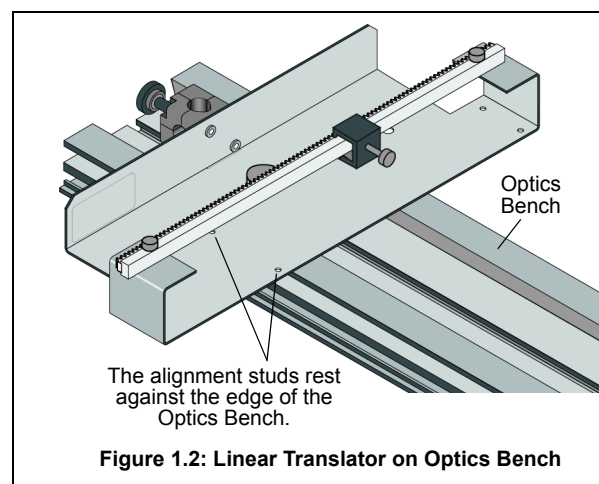
You can mount the Linear Translator on the Optics Bench in two ways: with the Rack perpendicular to the Optics Bench or with the Rack parallel to the Optics Bench.

Perpendicular Mount

To mount the Linear Translator so the Rack is perpendicular, leave the mounting hardware (the base thumbscrew and square nut) in the center hole. Loosen the thumbscrew by turning the thumbscrew counter-clockwise while holding the square nut. Leave the square nut on the end of the thumbscrew.

Attach the base to the Optics Bench by inserting the square nut into the T-slot located along the center of the Optics Bench. Use the two widely spaced alignment studs on the underside of the base to align the Linear Translator with the edge of the Optics Bench.

The Linear Translator can be moved to any position along the Optics Bench while the thumbscrew is loose. Tighten the thumbscrew to secure the Linear Translator in position.



Parallel Mount

To mount the Linear Translator so the Rack is parallel to the Optics Bench, move the mounting hardware from the center hole to the off-center hole (see Figure 1.3).

Turn the Linear Translator so the Rack is parallel to the Optics Bench. Insert the square nut into the T-slot located along the center of the Optics Bench.

The two narrowly spaced alignment studs that are at one end of the Linear Translator fit on either side of the top rail of the Optics Bench. Use one of the widely spaced alignment studs to align the Linear Translator with the edge of the Optics Bench.

Using a Rotary Motion Sensor

You can mount a PASCO Model CI-6538 Rotary Motion Sensor or the Model CI-6625 Rotary Motion Sensor for ULI on the rack of the Linear Translator.

The Rotary Motion Sensor has a T-slot into which you can slide the Rack of the Linear Translator. The first step is to remove the rack thumbscrews from the ends of the Rack. Turn the thumbscrews counter-clockwise to remove them.

You may also want to remove the Rack Clamp from the Rack. Turn the rack thumbscrew counter-clockwise until you can slide the Rack Clamp off the end of the Rack.

If you are using the three-step pulley on the Rotary Motion Sensor, hold the Rotary Motion Sensor so the three-step pulley is on top. Line up the Rack with the T-slot on the side of the Rotary Motion Sensor. The teeth on the Rack go through the narrow side of the T-slot and then engage a gear that is on the shaft of the Rotary Motion Sensor. Gently push the Rack through the T-Slot and into the sensor.

When the Rack is in the T-slot, put the Rack Clamp back onto the Rack and tighten its thumbscrew. Place the Rack with the sensor back onto the Linear Translator. The back end of the Rotary Motion Sensor rests on the upright edge of the base of the Linear Translator. Line up the holes in the ends of the Rack with the holes on the Linear Translator base. Put the thumbscrews into the holes and turn them clockwise to tighten.

If the Linear Translator is mounted parallel to the Optics Bench, move the rod clamp from the end of the Rotary Motion Sensor to one side or the other of the Rotary Motion Sensor. By doing this, the Light Sensor will be along the center line of the Optics Bench when you put the Aperture Bracket post into the rod clamp of the Rotary Motion Sensor.

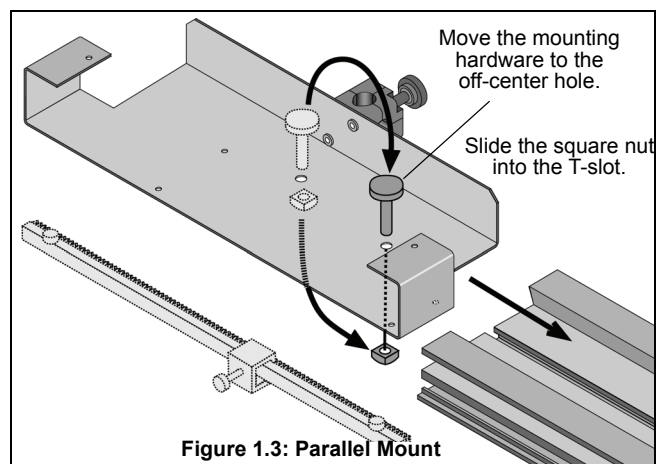


Figure 1.3: Parallel Mount

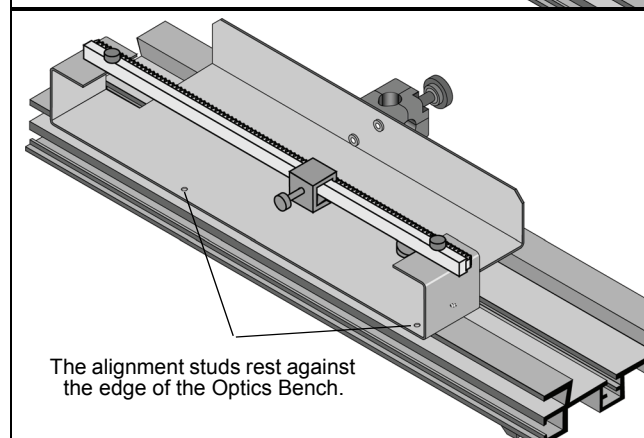


Figure 1.4: Translator Parallel to Optics Bench

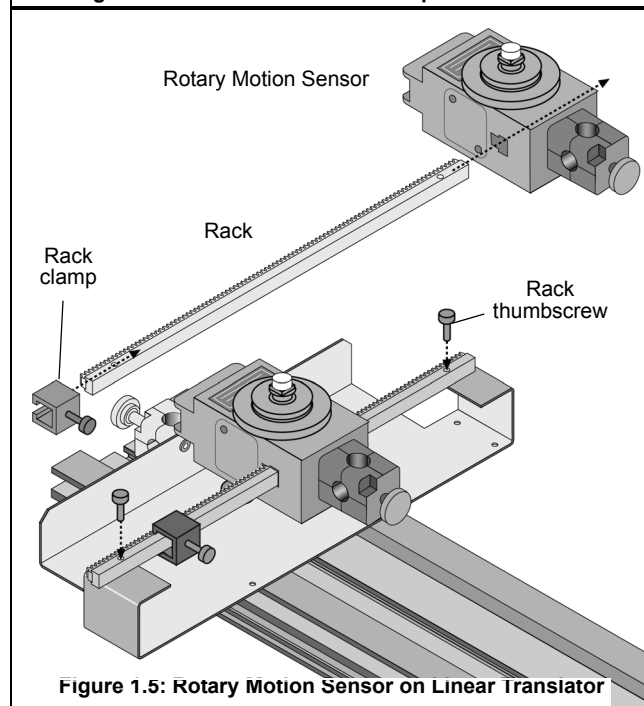


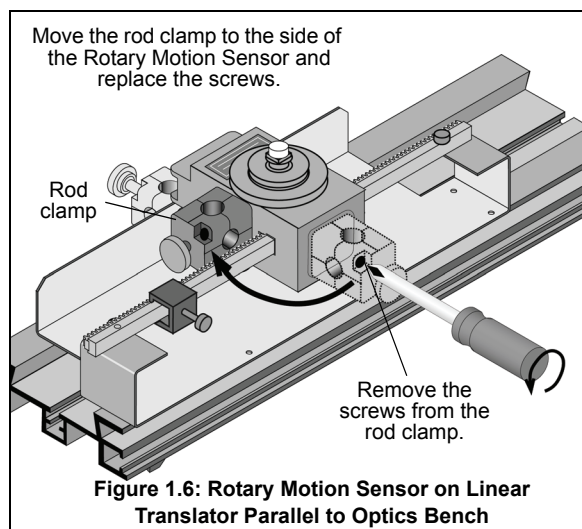
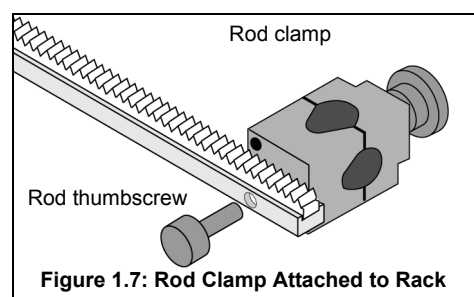
Figure 1.5: Rotary Motion Sensor on Linear Translator

You will need a Phillips head screwdriver with a small tip (e.g., #0). Use the screwdriver to remove the two screws from the end of the rod clamp. Align the rod clamp with the threaded holes on the side of the Rotary Motion Sensor. Replace the screws.

Using the Rack Separately

The rack of the Linear Translator can be used separately from the Linear Translator. For example, it can be an accessory to the Rotary Motion Sensor in experiments that do not require the Optics Bench but that do require the measurement of linear position.

Remove the two rack thumbscrews. Remove the rack clamp from the rack. Use a Phillips head screwdriver with a small tip (e.g., #0) to remove the two screws from the end of the rod clamp that is on the Linear Translator. Use one of the rack thumbscrews to attach the rod clamp to one end of the rack as shown. Use the rod clamp to hold sensors, etc.



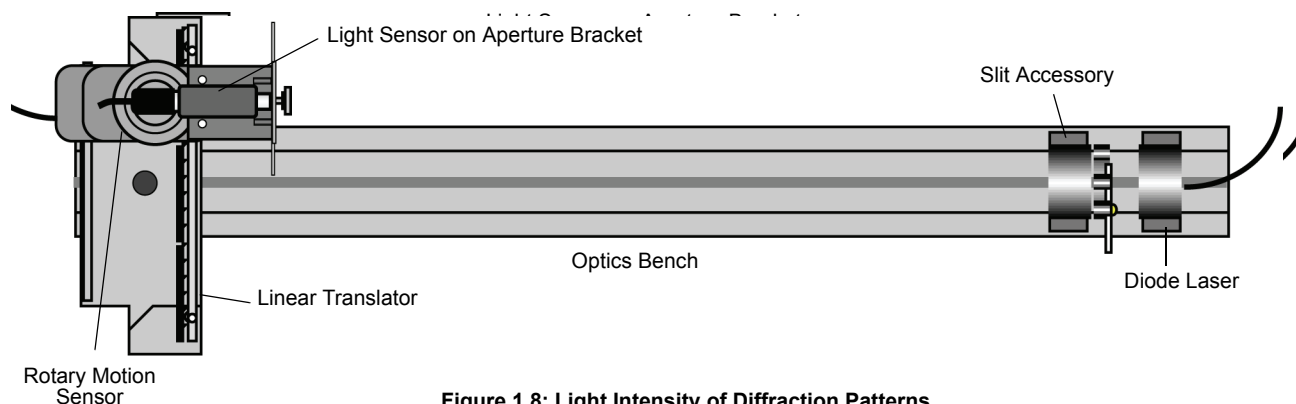
Suggestions for Using the Linear Translator

Light Intensity of Diffraction Patterns

EQUIPMENT NEEDED

Optics Bench	Linear Translator	Aperture Bracket
Slit Accessory	Diode Laser	Rotary Motion Sensor
Light Sensor	PASCO Capstone Software	PASCO Interface

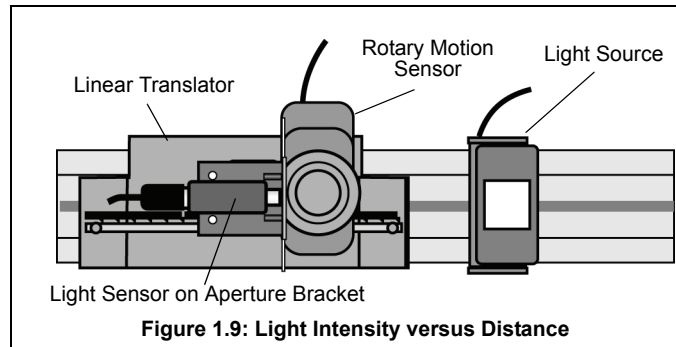
Use the Diode Laser and Slit Accessory to produce a diffraction pattern. Mount the Linear Translator on the Optics Bench so the rack is perpendicular to the Optics Bench. Use the Light Sensor to measure the intensity of light in the diffraction pattern. Use the Rotary Motion Sensor mounted on the Linear Translator to measure the position of the Light Sensor as it moves through the diffraction pattern.



Light Intensity versus Distance**EQUIPMENT NEEDED**

Optics Bench	Linear Translator	Aperture Bracket	PASCO Capstone Software
Light Source	Rotary Motion Sensor	Light Sensor	PASCO Interface

Use the Light Source to produce a “point source” of light. Mount the Linear Translator on the Optics Bench so the rack is parallel to the Optics Bench. Use the Light Sensor to measure the intensity of the light. Use the Rotary Motion Sensor mounted on the Linear Translator to measure the position of the Light Sensor as it moves relative to the Light Source.



Technical Support

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