

SPLIT VISION FIXTURE HJ4000 INSTRUCTION MANUAL

Thank you for purchasing the HJ4000 Split Vision Fixture.

Please read this manual before assembling and using the fixture. Please keep this manual readily accessible for reference.

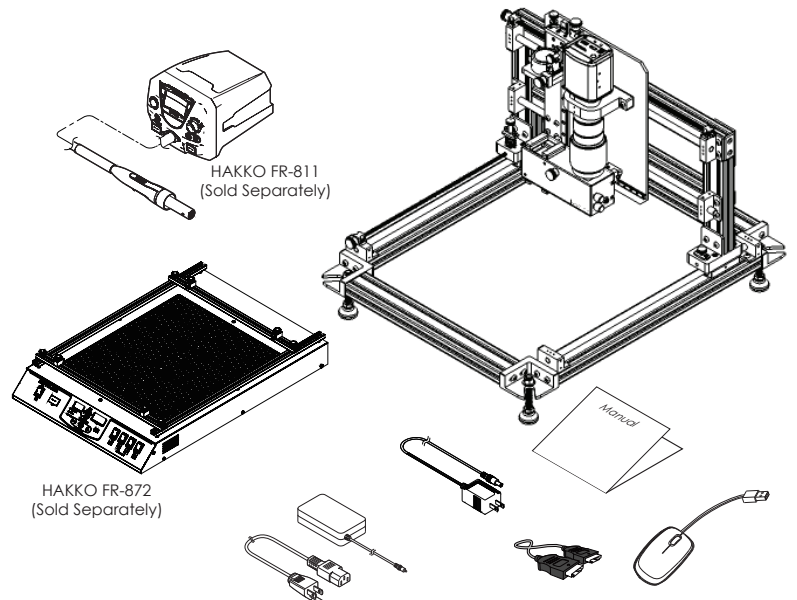
SPECIFICATIONS

Part No.	HJ4000	
Movement Range	X-Axis	355 mm (13.9 in)
	Y-Axis	343 mm (13.5 in)
	Z-Axis	247 mm (9.7 in)
	Theta	±30°
Field of View (F.O.V.)	16.6°	
Magnification/Zoom	Optical 1-6X Digital 10X	
Camera Type	CMOS 1/2.5"	
Optical Interface	C-Mount	
Resolution	5MP, 2592 x 1932 (Max)	
Camera Output	HDMI	
Lighting	Dimmable LED White (Top) / Blue (Btm)	
Power	12 VDC Camera 24 VDC Lighting	
Dimensions (L x W x H)	645 x 526 x 504 mm (25.4 x 20.7 x 19.8 in)	
Weight	11.92 kg (26.3 lb)	
ESD Safe	Yes	

Specifications and design are subject to change without notice.

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INITIAL SETUP

Unpacking

- Remove the packing materials and carefully lift the fixture out of the box and place it on a stable level surface.
- Remove the plastic wrapping around the fixture.
- Cut and remove the red plastic tie straps and remove the orange camera support.
- Remove the power supplies, video cables, and mouse from the accessories box.

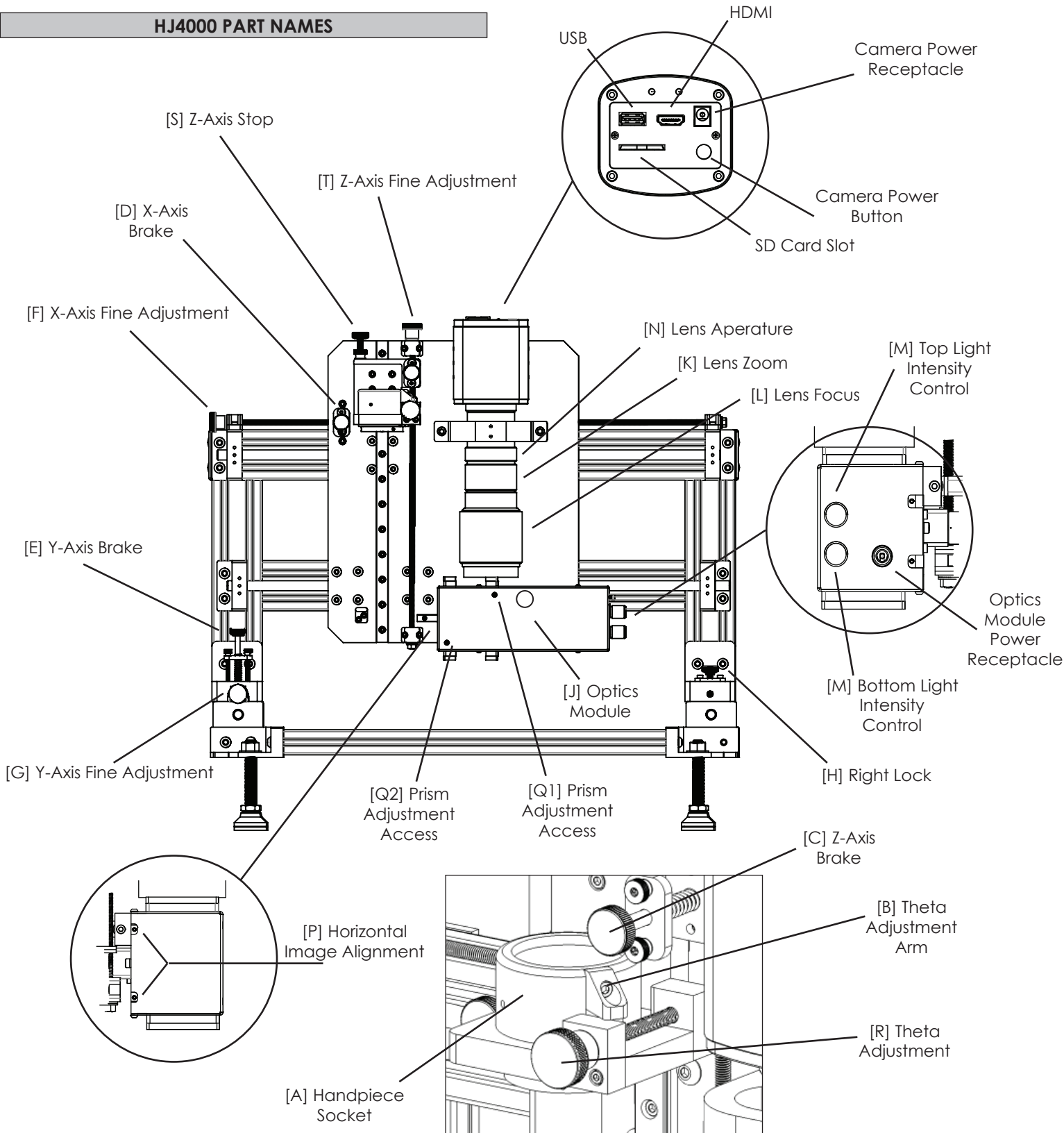
Setup

- Adjust the threaded rods for the 4 feet as needed to ensure the fixture is stable and relatively parallel to your working surface.
- Connect the HDMI cable from the camera module to your monitor (not included).
- Connect the USB mouse to the camera module.
- Plug in the power supply marked CAMERA into the camera module and press the POWER button.
- Plug in the power supply marked OPTICS into the right side of the optics module.
- Insert the handpiece of your HAKKO FR-810B/FR-811 station into the handpiece socket [A].
- Using an M1.5 hex wrench, tighten the three set screws at the bottom to secure the heater pipe of the handpiece in the center of the socket.
- Rotate the handpiece socket and check that the heater pipe is not wobbling. Adjust the three set screws as needed.

INITIAL SETUP (CONTINUED)

- After adjusting the three set screws for the heater pipe, use the same M1.5 hex wrench to secure the single set screw for the handle in the handpiece socket.
- Rotate the handpiece socket to align the flat channel with the theta adjustment pin and install the theta adjustment arm [B].
- Place your HAKKO FR-870B/FR-872 Preheater (optional) or other PCB holder within the base frame of the fixture.

HJ4000 PART NAMES



OPTICS ADJUSTMENT

BEFORE USING THE HJ4000 FIXTURE - ADJUST THE OPTICS USING THE FOLLOWING PROCESS

- Place a PCB into a holder or the preheater board holder that is within the base frame of the fixture.
- Extend the vacuum pickup tube from the handpiece.
- Release the Z-Axis Brake [C] and lower the handpiece so the vacuum pickup tube is above the PCB.
- Release the X-Axis Brake [D] and/or Y-Axis Brake [E] as needed to move the vacuum tube so it is above a clearly identifiable target on the PCB, such as a round pad or fiducial.
- Using the X-Axis Fine Adjustment [F] and/or Y-Axis Fine Adjustment [G], align the vacuum tube with the target.
- Now that you've mechanically and visually confirmed a correlation between the handpiece vacuum tube and a target on the PCB, engage the Right Lock [H] by tightening the knob, then release the Z-Axis Brake and raise the handpiece to the top.
- Slide the Optics Module [J] left until it stops.
- Adjust the Zoom [K] and Focus [L] of the lens to bring the PCB target into clear view.
- Using the Light Intensity [M] controls on the right side of the Optics Module, adjust the top (white) LED lighting and bottom (blue) LED lighting so the vacuum tube and target on the PCB are visible at the same time. If necessary, adjust the Aperture [N] of the lens if the lighting is too dark or too bright.
- Using an M1.27 hex wrench, adjust the two set screws [P] on the left side of the Optics Module to adjust the horizontal image alignment between the vacuum pickup tube and the target on the PCB. When adjusting, be sure to loosen one screw before tightening the other screw. Failure to do so will likely damage the adjustable base for the prism.
- If the image alignment needs to be aligned vertically, you will need to make small adjustments to the prism.
- Using an M2.0 hex wrench, adjust the top-right screw for the prism platform through the Access Hole [Q1] in the Optics Module. Adjusting this screw causes the image alignment to adjust vertically.
- Using an M2.0 hex wrench, adjust the lower-left screw for the prism platform through the Access Hole [Q2] in the Optics Module. Adjusting this screw causes the image as a whole to move vertically.
- Repeat the adjustments as necessary until you have a satisfactory image alignment, then release the Right Lock by loosening the knob.

NOTE: For greater accuracy, use two contact reticles or an HJ4000 Optics Calibratoin Kit (Optional - PN: 999-719) in place of the PCB target and vacuum pickup tube.

CAUTION: DO NOT OVERTIGHTEN THE PRISM PLATFORM SCREWS AS THAT CAN CAUSE DAMAGE TO THE PRISM PLATFORM.

CAUTION: DO NOT BEND OR TWIST THE OPTICS MODULE AS DOING SO WILL ADVERSELY AFFECT THE ALIGNMENT.

OPERATION

COMPONENT REMOVAL

- Place your PCB into a holder or the preheater board holder that is within the base frame of the fixture.
- Attach the appropriate N51 hot air nozzle and vacuum cup to the hot air handpiece.
- Slide the Optics Module left to the stop.
- Adjust the Zoom and Focus of the lens to bring the PCB into clear view.
- Release the X-Axis and/or Y-Axis Brakes as needed to bring the component to be removed into view.
- Using the Light Intensity controls on the right side of the Optics Module, adjust the top (white) LED lighting and bottom (blue) LED lighting so the outline of the hot air nozzle and the component are visible at the same time. If necessary, adjust the Aperture of the lens if the lighting is too dark or too bright.
- Using the X-Axis and/or Y-Axis Fine Adjustment knobs, align the nozzle so that it encompasses the component.
- If necessary, you can square the nozzle to the component using the Theta Adjustment knob [R].
- Slide the Optics Module right to the stop.
- Engage the Right Lock by tightening the knob.
- Release the Z-Axis Brake and lower the nozzle over the component.
NOTE: You can use the adjustable Z-Axis Stop [S] to ensure the nozzle can be repeatedly lowered to the same height.
- Engage the vacuum pickup system of your HAKKO hot air station and lower the vacuum pickup. Once the vacuum pickup makes contact with the component, turn the vacuum pickup knob one-half turn counter-clockwise to enable the pickup indicator on the handpiece.
- Start the rework profile of your HAKKO hot air station.
- When the profile is complete and the pickup indicator has risen, indicating complete reflow, release the Z-Axis Brake and raise the nozzle to remove the component.
- Release the Right Lock by loosening the knob.
- Place a heat resistant tray or pad below the nozzle and turn off the vacuum pickup to release the removed component.

NOTE: The vacuum pickup may retain vacuum for 10 to 15 seconds after you turn it off. Please wait for the component to release.

NOTE: Flux residue or a worn vacuum cup may cause the component to stick. Use a probe or tweezers to release the component.

OPERATION (CONTINUED)

COMPONENT PLACEMENT

- Place your PCB into a holder or the preheater board holder that is within the base frame of the fixture.
- Attach the appropriate N51 hot air nozzle and vacuum cup to the hot air handpiece.
- Slide the Optics Module left to the stop.
- Adjust the Zoom and Focus of the lens to bring the PCB into clear view.
- Release the X-Axis and/or Y-Axis Brakes as needed to bring the placement site for the component into view.
- Engage the vacuum pickup of your HAKKO hot air station and lower the vacuum pickup tube so the vacuum cup is just visible past the end of the nozzle edge.
- Using your stencil or ESD safe tray, raise the component under the nozzle so the vacuum cup can pick up the component.
- Using the Light Intensity controls on the right side of the Optics Module, adjust the top (white) LED lighting and bottom (blue) LED lighting so the I/O pattern on the bottom of the component and the land pattern on the PCB visible at the same time. If necessary, adjust the Aperture of the lens if the lighting is too dark or too bright.
- Using the X-Axis and/or Y-Axis Fine Adjustment knobs, and the Theta Adjustment knob, align the pattern on the component with the pattern on the PCB.
- Once aligned, engage the Right Lock by tightening the knob and slide the Optics Module right to the stop.
- Release the Z-Axis Brake and lower the component until it is slightly above the surface of the PCB.
- Using the Z-Axis Fine Adjustment knob [T], slowly lower the component until it is touching the PCB and coplanar.
NOTE: You can use the adjustable Z-Axis Stop to ensure the component can be repeatedly lowered to the same height.
- Turn off the vacuum pickup on your HAKKO hot air station.
NOTE: The vacuum pickup may retain vacuum for 10 to 15 seconds after you turn it off. Please wait for the component to release.
- After the vacuum pickup has released, use the Z-Axis Fine Adjustment knob to slowly raise the nozzle until it is approximately two to three millimeters above the component.
- Start the rework profile of your HAKKO hot air station.
- When the profile is complete, release the Z-Axis Brake and raise the nozzle away from the component.
- Release the Right Lock by loosening the knob.
- Remove the PCB from the holder or preheater board holder.

CAUTION: The PCB may still be hot after the reflow process so use caution when handling.

MAINTENANCE

The HJ4000 Rework Fixture is designed to be nearly maintenance free. The only parts of the fixture that may need attention periodically are as follows:

- **OPTICAL COMPONENTS** - Keep the optical parts (prism, secondary mirror, and lens) free from dust or flux residues. If you need to clean them, use the cleaning methods appropriate for optical equipment.
- **BEARINGS, RODS, and RAILS** - Keep all bearings, rods, and rails free from debris. You may wipe down the rails and rods using a lint free cloth with machine oil. The large linear bearings blocks for the Y-Axis have grease fittings on the outside. These bearings will normally not require grease lubrication as they are under a light load and will perform well with the machine oil coating of the rods when you wipe them down to keep them free from dust. If the bearings are not rolling freely, you may apply a No. 2 grease to the bearing block using a grease gun and the grease fittings on the block.

SUPPORT

Should your HJ4000 Rework Fixture require service due to damage, please contact Customer Service at American Hakko to obtain a Case number for return of your fixture for evaluation.

- Telephone: 1-800-88-HAKKO (42556)
- E-mail: support@HakkoUSA.com



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