Getting Started Guide

First Edition: April 2017

Document Part Number: 926590-001

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1 Safety instructions

⚠ **WARNING!** To reduce the risk of electric shock or damage to your equipment:

— Do not disable the power cord grounding plug. The grounding plug is an important safety feature.

— Plug the power cord into a grounded (earthed) outlet that is easily accessible at all times.

— Disconnect power from the equipment by unplugging the power cord from the AC outlet.

⚠ **WARNING!** To reduce potential safety issues, only the AC adapter provided with the product, a replacement AC adapter provided by HP, or an AC adapter purchased as an accessory from HP should be used with the product.

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The devices and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap. Use the device only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The device and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

Never look directly into the projector lens when the lamp is turned on.

Use the device on a stable surface only. Dropping the unit might severely damage it, and the glass calibration panel might break.

⚠ **CAUTION:** Broken glass might cause a laceration hazard.

For more projector safety instructions, see the included ACER projector CD.

2 Getting started

Kit contents

- HP 3D Structured Light Scanner Pro S3 or HP 3D Structured Light Scanner Pro S2, preassembled
  - Video projector
  - Camera (with lens)
  - Base rail with camera slide
- Tripod with carrying case
- Glass calibration panel and 90° brackets (2)
- USB flash drive with HP 3D Scan Software and camera drivers
- AC adapter
- HDMI cable
- USB cable
- Cable strap and carrying case

System requirements

NOTE: Technical specifications are subject to change without notice.

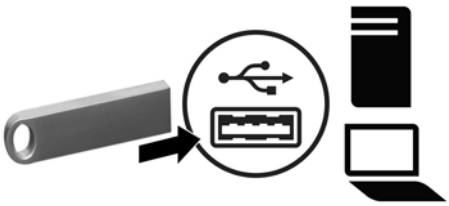
- Operating system
  - Windows® 10 (64-bit)
  - Windows 8 (64-bit)
  - Windows 7 (64-bit)
- Microsoft® .NET Framework 4.5 (64-bit)
- 3D-capable graphics card
- HDMI port
- USB ports (2)

- Recommended: Dual-core processor, 2 GHz
- Recommended: 8 GB RAM
- Recommended: NVIDIA or AMD graphics card

3 Setup

Installing the software and drivers

1. Connect the USB flash drive to your computer.



2. Optionally, go to http://www.hp.com/go/3DScanSupport, and then select **drivers, software & firmware**. Select your scanner, select your operating system, and then download **HP 3D Scan Software Pro v5**.

NOTE: Do not disconnect the USB flash drive from your computer. It contains the license file to use the software.

3. Open **Windows Explorer**, and double-click **HP_3D_Scan_Setup_5.x.x.exe** (if using the USB flash drive) or the name of the downloaded software installer.

NOTE: You must be logged on as an administrator.

4. Select **Full installation** as the profile.
5. Follow the on-screen instructions.

For more information, see the *HP 3D Scan Software Pro v5 Online Instructions*. Go to http://www.hp.com/go/HP3DSWProV5manual.

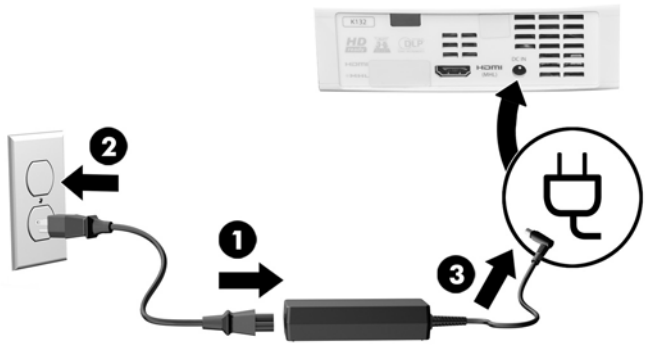
Setting up the scanner

NOTE: Before connecting the projector or camera to your computer, install the software and drivers.

1. Set up the tripod according to the manufacturer's instructions.

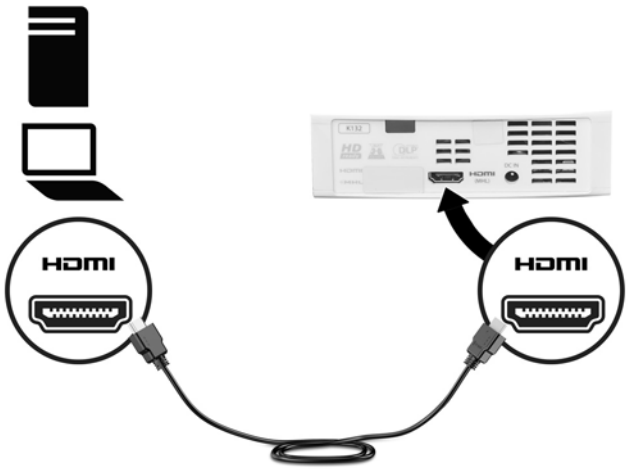
2. Slide the scanner assembly onto the tripod **(1)**, and fasten the thumbscrew on the tripod until the assembly is secure **(2)**.

3. Connect the included power cable to the AC adapter **(1)**, connect the power cord to an AC outlet **(2)**, and then connect the AC adapter to the power connector on the rear of the projector **(3)**.

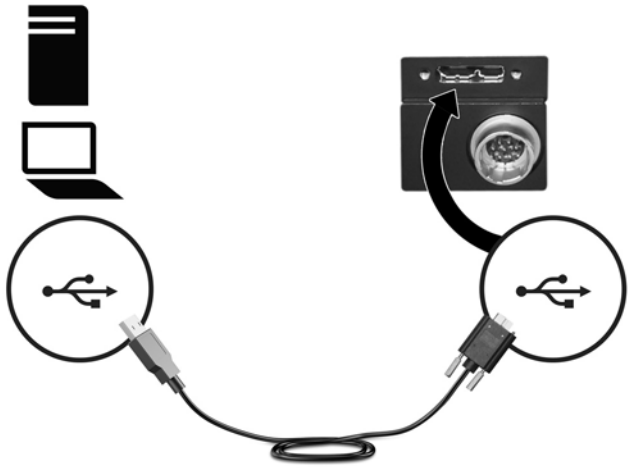


4. Connect one end of the included HDMI cable to the HDMI port on the rear of the projector, and then connect the other end of the cable to an HDMI port on your computer.

NOTE: By default, the projector source is set to HDMI. However, if you press the source button on top of the projector twice within 4 seconds, the source is set to VGA. To reset the projector source, see Using the projector controls on page 10.



5. To turn the projector on, press the power button on top of the projector.
6. Connect one end of the included USB cable to the USB port on the rear of the camera, and then connect the other end of the cable to a USB port on your computer.



7. Remove the lens caps from the projector and camera.

Positioning the camera

Mounting the camera

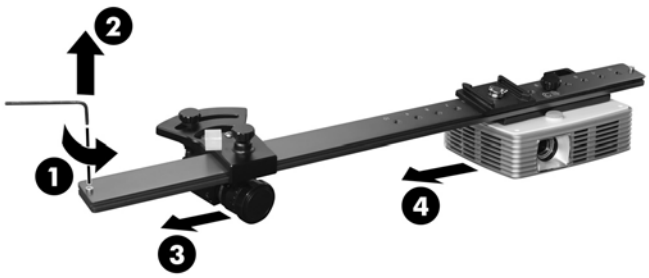
The camera can be mounted either to the right or to the left of the projector. Use the following table to determine where to mount your camera.

NOTE: If you are using two cameras (second camera sold separately), mount one camera on each side of the projector.

Size of the object or region to be scanned	Mounted position of the camera (as seen from the rear)
< 110 mm	Left
110 to 350 mm	Either, but optimally the left
> 350 mm	Right

If necessary, you might have to mount the camera slide to the corresponding side of the base rail. Use the following procedure:

1. Use the included Allen key to loosen the stopper screw **(1)** at the end of the base rail, and then remove the screw from the rail **(2)**.
2. Loosen the thumbscrew fastening the camera mount to the base rail, and slide to remove the camera and mount assembly from the base rail **(3)**.
3. Loosen the thumbscrew fastening the projector to the base rail, and slide the projector to the other side of the base rail **(4)**.



4. Tighten the projector thumbscrew.
5. Use the included Allen key to loosen the stopper screw at the other end of the base rail, and slide the camera and mount assembly onto the base rail.
6. Tighten the camera mount thumbscrew.
7. Replace the stopper screws.

The exact distance of the camera from the projector is set during a scan operation. The distance between the camera and projector is similar to the size of the object or region to be scanned.

NOTE: The distance is between the lenses of the projector and camera, not between the two chassis.

- To scan a small object, the camera is mounted to the left a short distance from the projector.

- To scan a large object, the camera is mounted to the right a longer distance from the projector.

Rotating the camera

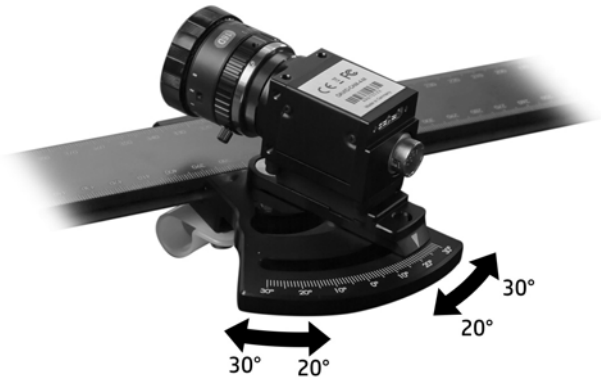
To aim the camera at the projection area:

1. Loosen the thumbscrew under the camera.

2. Set the rotation angle using the degree scale printed on the camera slide.

NOTE: Typically, an angle of 22° is used. For very large objects or regions, or objects with deep cavities, a smaller camera angle might be necessary. Angles less than 20° cause reduced scan quality, introducing more camera noise and inaccuracies. For flat objects, a large camera angle (up to 30°) might be necessary. Large camera angles reduce the depth of the measurement range.

If using two cameras (second camera sold separately), HP recommends using the same angle for each camera for optimal results. Similar angles can be used; however, if the difference in camera angles is too large, the scan is not as precise. You can use an angle smaller than 20°, but no smaller than 10°. If using a smaller angle, do not use Extended View mode.



3. Fasten the thumbscrew.

Using the camera controls

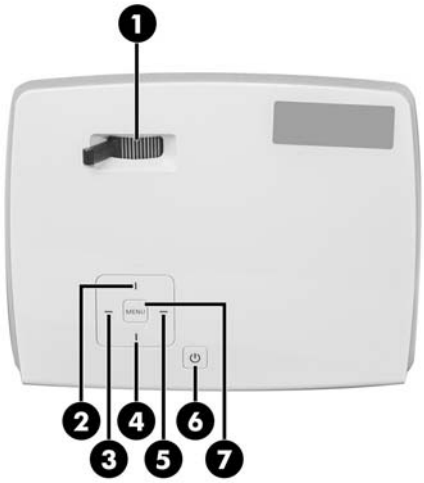
To set the camera aperture, loosen the lens screw closer to the body of the camera **(1)** and twist the adjustment ring closest to the camera **(2)**. Fasten the screw when the aperture is set.

TIP: The aperture f-stop can be set between 16 and 1.4. Set the aperture to a lower f-stop in dark conditions and a higher f-stop in bright conditions. The sharpness of the image is lost if the camera aperture is set to an f-stop higher than 16.

To set the camera focus, loosen the lens screw farther from the body of the camera **(1)** and twist the adjustment ring farther from the camera **(2)**. Fasten the screw when the aperture is set.

Setting up the projector

Using the projector controls



Press the power button **(6)** to turn the projector on or off.

Slide the focus lever from left to right to set the focus **(1)**. During a scan, you want the projected stripe pattern to be perfectly focused on the scan object surface.

Press the source button **(2)** to change the input source. Press the up button **(2)** and down button **(4)** to switch between HDMI and VGA. Press the right button **(5)** to confirm your selection, or press the source button **(2)** twice within 4 seconds to switch between HDMI and VGA.

Press the menu button **(7)** to open the projector menu on your computer. HP does not recommend changing the settings. The recommended settings are as follows:

NOTE: If it is necessary to restore these settings, see the projector manual from the manufacturer.

- Projection Mode: F
- Projection Location: TABLE

- Auto Keystone: Off
- Manual Keystone: 0

Setting the projector as an extended desktop

1. On your computer, right-click a blank area of the desktop.
2. Select either **Screen resolution** or **Properties**.
3. Verify that your computer monitor is set as the primary monitor.
4. Under **Display**, select the projector.
5. Under **Multiple displays**, select **Extend these displays**.
6. Under **Resolution**, select **1280 × 800**.
7. Select **Advanced settings**.
8. On the **Monitor** tab, set the refresh rate to **60 Hz**.
9. Select **OK**, and then select **OK** again.

If the HP 3D Scan Software window is displayed on the projector, perform a drag-and-drop operation to move the window to your computer monitor.

Setting up the calibration panel

1. Open the calibration panel so that the pattern on the side you are using is folded inward **(1)**, connect it to the bottom bracket **(2)**, and then connect the second bracket to the top **(3)**.

NOTE: Set up the calibration panel only on a flat surface.

Select the calibration pattern based on the object or region to be scanned. Use a pattern slightly larger than the object or region. For objects larger than 200 mm, use the 240 mm pattern on the back of the calibration panel.

2. Move the calibration panel assembly so that it is in front of the scanner, at approximately the same distance as the object or region to be scanned. Set the projector and camera at an angle to the panel, and set the projected pattern as large as possible. Set the camera so that 15 to 70 calibration markers are displayed in the camera image.

NOTE: You can move the scanner assembly and tilt or adjust the tripod, but do not change any of the projector or camera settings. If you move the camera or projector separately or adjust the focus, repeat the calibration process.

For more information, see the *HP 3D Scan Software Pro v5 Online Instructions*. Go to http://www.hp.com/go/HP3DSWProV5manual.

Connecting an optional security cable

NOTE: The security cable is designed to act as a deterrent, but it may not prevent the scanner from being mishandled or stolen.

To install a security cable:

1. Loop the security cable around a secured object.
2. Insert the key into the security cable lock.
3. Insert the lock into the security cable slot on the side of the projector and then turn the key.

4 Troubleshooting

Scan quality

Problem	Solution
The scans are noisy (that is, the surface of the object is rough).	Set the camera aperture (f-stop) so that the red intensity curves (in the scanner software) are not cropped. After you reset the aperture, recalibrate the scanner using the calibration panel.
	Increase the camera angle to at least 20°, and then increase the distance between the camera and the projector lenses. After you reset the angle and distance, recalibrate the scanner using the calibration panel.
	Reduce the ambient light. Avoid fluorescent lights and all flickering light sources.
	For software solutions, see the *HP 3D Scan Software Pro v5 Online Instructions*. Go to http://www.hp.com/go/HP3DSWProV5manual.
The scans show a regular wave pattern.	Set the camera aperture (f-stop) so that the red intensity curves (in the scanner software) are not cropped. After you reset the aperture, recalibrate the scanner using the calibration panel.
	Reduce the ambient light. Avoid fluorescent lights and all flickering light sources.
	Be sure that the projector is set to the optimal settings. In the projector software, set all filters to neutral (default values) and be sure that no artificial contrast enhancement is active. After you reset the projector settings, recalibrate the scanner using the calibration panel.
	If the object is shiny, the projector light might reflect directly to the camera. If necessary, use a spray to make the object more matte.
	Make sure that the camera image does not flicker. Set the exposure time of the camera to match the frame rate of the projector (1/60 s and 60 Hz respectively).
	Be sure the scanner and object do not move during a scan. If you are scanning a person, be sure they sit comfortably and hold their breath.
	For software solutions, see the *HP 3D Scan Software Pro v5 Online Instructions*. Go to http://www.hp.com/go/HP3DSWProV5manual.
Fine details are missing from the scan.	Set the scanner at the smallest possible working distance from the object to increase the scan detail.
	Make sure that the distance between the scanner and the object is the same distance used during calibration.

Problem	Solution
	Make sure that the scanner and projector are both focused on the object.
The scan contains irregular distortions or outliers.	Make sure that the ambient light is constant. Avoid fluorescent lights and all flickering light sources.
	Make sure that nothing moves in view of the camera, including behind the object.
	Be sure the scanner and object do not move during a scan. If you are scanning a person, be sure they sit comfortably and hold their breath.
	If the object is shiny, the projector light might reflect directly to the camera. If necessary, use a spray to make the object more matte.
	Use a dark background that reflects almost no light (such as black fabric).
	For software solutions, see the *HP 3D Scan Software Pro v5 Online Instructions*. Go to http://www.hp.com/go/HP3DSWProV5manual.
The color textures do not look correct.	For software solutions, see the *HP 3D Scan Software Pro v5 Online Instructions*. Go to http://www.hp.com/go/HP3DSWProV5manual.

Further problems and solutions

If an error message about a missing license is displayed, connect the USB flash drive to your computer and then run the scanner software.

Issues such as alignment or fusion can be solved using the scanner software. Many issues can be corrected by recalibrating the scanner.

For software solutions, see the *HP 3D Scan Software Pro v5 Online Instructions*. Go to http://www.hp.com/go/HP3DSWProV5manual.

If the software crashes or exhibits unexpected behavior, try the following solutions in order:

- Make sure that your computer has enough memory available. Close other programs and do not work on multiple scans simultaneously.
- Contact HP support.