FAQ

HP Z 3D Camera

Contents

* Display is not included.

Announcement

What is being announced?

HP announced the HP Z 3D Camera at CES 2018. The HP Z 3D Camera is a USB accessory that mounts to most desktop PC monitors, providing a down-facing, high resolution 2D camera and real-time 3D depth sensor designed to reinvent creative workflows and spark spontaneous visual collaboration.

• With the HP Z 3D Camera, HP is delivering on its commitment to unleash the creativity and collaborative spirit of individuals and teams.

• With the HP Z 3D Camera, HP is providing easy, intuitive 3D scanning to create life-like digital images by rotating an object in your hands or positioning it under the camera. Integrated 3D SLAM tracking technology constructs the 3D model in real time, while high resolution texture capture adds a life-like quality to it.

• HP is collaborating with Microsoft to bring more 3D content to the newer Windows 3D applications such as Paint3D, Mixed Reality Viewer, and PowerPoint with 3D capabilities, thus reinventing workflows for a wide range of content creators.

Overview

What is the HP Z 3D Camera?

The HP Z 3D Camera is a high definition 2D and 3D depth camera that attaches to a display. It is meant to augment an existing hardware setup, and itself is composed of three pieces:

• HP Z 3D Camera (1)
• Magnetic mounting badges (3 included in package)
• HP Scan Mat (1)

What does the HP Z 3D Camera do?

The HP Z 3D Camera can capture 2D content (e.g. images) as well as 3D content (e.g. geometry and texture) and can also be used as a downward-facing camera in a "live view" mode to facilitate visual communication in remote collaboration settings.

What can the HP Z 3D Camera be used for?

• 3D scanning to produce digital assets.
• 2D scanning / image capture.
• Downward-facing video capture (both live and recorded).

What is the difference between HP Z 3D Camera and Sprout Pro G2

The HP Z 3D Camera and the Sprout Pro G2 share similar camera features, but have several important differences:

First, *the HP Z 3D Camera is not a computing device.* It is an accessory camera that must be connected to an existing computer via USB to work. The Sprout Pro G2 is an All-In-One (AIO) computer that incorporates the same camera technology as the HP Z 3D Camera, but its camera hardware is built into the device and is not removable.

Second, *the HP Z3 3D Camera does not have a projector.* It uses an IR Sensor to capture 3D images via the Camera 3D WorkTool. A projector is required to capture 3D using Structured Light Scanning (SLS) via HP Pro 3D Scan software. Sprout Pro G2 has both an IR sensor and a projector, meaning it can capture 3D in two ways. SLS provides 3D geometry that lends itself to 3D print. The HP Z 3D camera is better suited for capturing physical objects to be used for visualization in AR, VR, Gaming, Video environments.

Third, *the HP Z 3D Camera does not have a TouchMat.* The HP Z 3D Camera comes with the HP Scan Mat which is a passive mat, not the active touch/pen digitizer TouchMat that comes with the Sprout Pro G2.

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	All In One device	3D Capture using IR Sensing (via Camera 3D WorkTool)	3D Capture using SLS (via HP 3D Scan Pro software)	Creates 3D captures best suited for...
HP Z 3D Camera		✓		Manipulation and/or visualization in AR/VR/Gaming/Video environments
Sprout Pro G2	✓	✓	✓	For 3D printing and 3D for visualization in AR/VR/Gaming/Video environments

	Camera 3D WorkTool (SLAM Scanning)	HP 3D Scan Pro (Structured Light Scanning)
WIREFRAME	109k polygons	8,000k polygons
SHADED		
TEXTURED		

- Both the HP Z 3D Camera and Sprout Pro G2 do 2D scanning, showing/recording live downward-facing video, and 3D scanning using the HP WorkTools Capture and Camera 3D software.

- HP Z 3D Camera is not compatible with HP 3D Scan Pro software, due to lack of a built-in light source, whereas Sprout Pro G2 is compatible with that scanning software because of its projector.

Who would use an HP Z 3D Camera and why?

3D and 2D artists or professionals whose work regularly includes visual content creation for digital environments. The HP Z 3D Camera provides a way to save time in content creation workflows, by quickly capturing real-world geometry and textures to import into 2D/3D visual content-authoring software. Artists/Professionals who spend long hours creating base forms can accelerate the production of digital objects by scanning real world objects for manipulation (reducing the number of man hours to produce). HP Z 3D Camera is uniquely suited for reducing the time to create organic objects in 2D and 3D visualization.

There are many people who might find this beneficial to their own work. These include professionals working in CGI/VFX pipelines, who work with 3D digital content, as well as 2D professionals (e.g. graphic designers), who are incorporating 3D content into their workflows. This set of users will be familiar with one or more of the following software programs:

- Pixologic™ ZBrush® 4R8
- Substance Designer, Substance Painter, or Substance B2M
- Adobe Dimension and Adobe Photoshop
- Microsoft PowerPoint with 3D compatibility

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Visual thinkers and communicators. The HP Z 3D Camera improves remote collaboration experiences by providing a downward-facing and high-resolution view to facilitate visual communication.

The downward-facing camera can act like a webcam, but is not an ordinary webcam – it is a 14.6MP camera that offers high resolution 2D still and video capture. This can increase visual communication capabilities in scenarios where a person might be sharing the creation of quick diagrams or lists, brainstorming ideas, or showing physical prototype products, etc.

There are many people who might find this beneficial to their own work, for example, those who are:

• Participating in product iteration cycles
• Sharing visual designs, plans, product prototypes, etc. remotely with clients or team members
• Communicating abstract concepts
• Working with remote, multicultural teams across countries and languages

Is HP Z 3D Camera compatible with all 3D Design software?

The HP Z 3D Camera creates 3D assets that can be exported to .obj or .3mf files. It is compatible with 3D design software that accept these types of files as imports.

What file types does the HP Z 3D Camera export?

The Capture WorkTool for HP Z 3D Camera exports 2D images: jpg, png, and searchable pdf. The Camera 3D WorkTool exports obj, mtl, and color jpg, as well as 3mf. The Stage WorkTool (visual clipboard) exports png, jpg, and its own format, .stage files.

What industries/companies would benefit from an HP Z 3D Camera?

• Media & Entertainment (CGI/VFX, Gaming, AR/VR, etc)
• Product design and manufacturing
• Marketing, PR
• Engineering design and fabrication
• Education
• Architecture and design firms looking for tools to increase creativity and productivity
• Companies with multiple locations looking for innovative tools to help their teams collaborate (consulting, etc)

Getting Started

What are the recommended system requirements for using the HP Z 3D Camera with my computer?

• Operating System: Windows™ 10 64-bit Anniversary Update (Version 1607)
• CPU: 7th Generation Intel® Core™ i7 Processor
• System Ram: 16 GB DDR4
• Disk space: 2GB
• Graphics: NVIDIA® GeForce® GTX 960M
• Monitor: Full HD Resolution (1920 x 1080)
• USB: 1 x USB 3.0 Type-A and 1 x USB 2.0 Type-A
• Internet connection required

Is the HP Z 3D Camera compatible with Mac OS?

No. The WorkTools applications that are needed to drive the HP Z 3D camera are only compatible with Windows.

Why is Windows 10 Creator's Update recommended (although not required)?

Windows 10 Creator's Update natively provides a better experience for handling 3D files and content. It includes native applications like Paint3D and Mixed Reality Viewer that accept 3D content seamlessly – this creates opportunities to use the 3D digital content that the HP Z 3D Camera creates in a scan, and delivers a more fluid experience for working with this type of content.

How do I get PowerPoint with 3D capabilities?

The most updated versions of both Microsoft Office 365 and Office 2016 support 3D capabilities in Word, PowerPoint, Excel, and Outlook. To use this feature, simply install the most current version of this software.

What are the display requirements for use with the HP Z 3D Camera?

- The installation instructions (plastic flap on magnetic badge) show two monitor sizes – 24" and 27". These are guides that reflect recommended setups. However, the device can be attached to and used on any flat or curved backed monitor that provides the necessary height requirement when the device is mounted behind it.

- The display must provide enough height to be able to mount the HP Z 3D Camera in a way that supports the effective working range of the camera.

    - The HP Z 3D Camera's minimum effective working range starts at ~30cm (~12") below the camera . Therefore, the camera must be mounted at a height that allows for this 30cm plus the height of any object being scanned.
    - For example, if you plan to scan objects that are approximately 10 cm (4") tall, the HP Z 3D Camera must be mounted at least 10cm + 30cm (4" + 12") from the desktop.
    - Most displays will allow for enough working distance (excluding laptop displays), given that the size of the object being scanned is not oversized.

- The 3D camera's maximum working effective working range is approximately 1m (39"). However, note that resolution/accuracy will decrease as the distance to the object being scanned is increased.

- The magnetic badge for mounting measures 3 in x 3 in (7.6 cm x 7.6 cm).

How do I attach the HP Z 3D Camera to my display?

- The device attaches magnetically to a mounting badge, which must first be placed on the back of the display. The mounting badge uses an adhesive which is not meant to be removed once it has been placed.

- PLEASE NOTE: Once the mounting badge has been attached, it can be peeled off within one minute relatively easily, but gets harder to remove after that, as the adhesive forms a stronger bond over time to ensure a stable mount. This is a feature, and as such, it is important to measure and determine the location where it should be mounted, BEFORE starting to attach the mounting badge.

- Height from the work surface is the most important aspect of determining where to place the mounting badge. Final placement must allow at least 30cm working distance for the camera, from the object.

- Instructions for how to mount the badge are on an insert in the box.

Will the adhesive on the mounting badge damage my monitor after prolonged contact?

This has not been exhibited, nor is it expected. These are similar adhesives to those which are already commonly used on the plastic parts of the display's rear casing.

How do I connect the HP Z 3D Camera to my computer? What USB ports are needed?

- Power on the computer and connect to the internet.

- There are two USB cables that must both be connected to the computer. The device will not work with only one cable plugged in.

- Two USB ports are needed: One must be USB 3.0, and the other can be USB 3.0 or 2.0.

- USB 3.0 hubs are supported as long as the hub is plugged into a USB 3.0 port.

- When the device is plugged in, the HP Z 3D Camera software will download and install automatically.

What software is needed to run HP Z 3D Camera?

HP WorkTools is the suite of applications that allows the user to access and fully utilize the immersive capabilities of HP Z 3D Camera. It downloads and gets installed automatically (Internet access required) when the HP Z 3D Camera is plugged into the system (which is already powered on).

All of the HP WorkTools are required to help you learn, use, and maintain the HP Z 3D Camera, however the WorkTools that specifically access the camera functions are Capture and Camera3D.

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WorkTool	Description
Launcher	Launch bar that enables quick launch of Discover, Stage, Capture, Camera 3D or Control WorkTool .
Welcome	Set up your HP Z 3D Camera and get started quickly with this simple step by step introduction.
Discover	Update your HP Z 3D Camera software, download new apps and explore how to make the most out of your HP Z 3D Camera experiences.
Stage	Easily store or visually organize your captured or imported contents.
Capture	Access the camera to scan objects and documents in 2D and utilize live view, editing, and external display presentation capabilities.
Camera 3D	Access the camera to scan physical objects in a matter of seconds by simply holding and rotating the object under the HP Z 3D Camera to create high-quality 3D digital model content.
Control	Adjust the hardware settings of HP Z 3D Camera, perform calibrations for the HP Scan Mat, and find software information.

What is Camera 3D?

Camera 3D, part of the HP WorkTools, is HP's award-winning 3D scanning software that allows physical objects to be captured in 3D in a matter of seconds by simply holding and rotating the object under the HP Z 3D Camera. It uses Simultaneous Location and Mapping (SLAM) technology to track and capture geometry from physical objects in a matter of seconds. It also collects high-resolution images and texture, which, combined with the captured geometry, creates a life-like 3D digital model.

What is the HP Scan Mat, and why is it needed?

The HP Scan Mat is used for camera calibration and alignment purposes only. It does not attach to the device, and it is not a digital inking surface.

• With calibration, the user can opt to put the camera view into a keystone-corrected mode, which provides a better experience for visual communication and live sharing during remote collaboration sessions.
• With calibration, the mat can also function as a visual guide for where to place objects on the desk surface when 2D scanning – the user can know that anything within the mat boundary will be seen by the camera.
• If used when 2D scanning an object, the software will be able to perform instant background removal (segmentation). If the mat is not used, the image is still captured, but the software will not be able to do background removal on it.

3D scanning objects does not require the HP Scan Mat, but should be used to ensure the best white balance and camera exposure for the best color texture image quality.

How do I calibrate the HP Scan Mat?

Download, install, or open the Control WorkTool. Follow the instructions on how to calibrate the mat within this application, after the HP Z 3D Camera has been set up.

Can I use a stylus with the Mat?

No. The Mat is used for calibration / alignment purpose only that provides a designated background / work area for image capturing and scanning. The mat is not used as an input device, which means no pen/stylus will work with it.
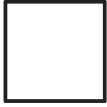
Can the HP Z 3D Camera be locked down, so as not to be stolen?

It can be secured to a desk or monitor by using a typical cable lock (not included).

What can be 3D scanned using the HP Z 3D Camera? What cannot? Are there any limitations on the 3D scanning capabilities of the HP Z 3D Camera?

• It is impossible to create a list of objects that scan well, or those that do not – simply because every object has a different set of variables. The best way to find out if an object scans is to try it out. However, there are some important variables that are required to get a good scan. The following points can help you learn how to identify what will scan well and what will not.

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	IMPOSSIBLE TO SCAN	DIFFICULT TO SCAN	EASIER TO SCAN
OBJECT SIZE	3" x 3" x 3"	6" x 6" x 6"	9" x 9" x 9
OBJECT SHAPE	Symmetrical and flat	Symmetrical but volumetric	Asymmetrical, volumetric, feature rich
RIGIDITY	Floppy and flexible	Stable when handled	Solid and rigid
MATERIALITY	Reflective, mirror finish	Partially glossy, dark	Organic, matte finish, light colored
COLOR DETAIL	No color detail	Sparse or little color detail	Random, non-repeating color detail
TRANSPARENCY	Transparent	Semi-Transparent	Opaque

- **FOR EXAMPLE ONLY:** here is a **non-exhaustive list** of objects that exhibit these variables favorably and thus usually scan well: Medium- to large-sized figurines, objects with varied organic shapes like driftwood, medium-sized rocks or gemstones, hand-carved or sculpted clay or wood, and Papier-mâché. The more varied the geometry and texture, the more likely the object will product a good scan.

- Mounted on an average display monitor, the scannable volume created by the HP Z 3D Camera is approximately 12"L x 12"W x 10"H (30cm L x 30cm W x 25cm H). Objects that scan best are between 4-10" (10-25cm) in size, rigid, feature-rich, opaque, matte finish, and light colored.

- To develop an intuition for what will scan well, one must understand that the HP Z 3D Camera scanning technology is based on several key aspects:

    - *Depth sensors project invisible dot patterns onto the scan objects and determine the depth of the features of the object by measuring the reflected pattern.*

      The physical properties of light can provide some clues on the limitations of scanning using this technology:

        1. Transparent materials allow light to travel directly through them, and therefore the projected dot pattern does not reflect back to the sensor, making transparent objects difficult to scan.
        2. Black materials absorb light, and therefore the projected dot pattern does not reflect back to the sensor making black surfaces difficult to scan.
        3. Shiny or glossy materials reflect light away from the light source (unless directly facing the light source), and therefore the projected dot pattern does not reflect back to the sensor making shiny or glossy surfaces difficult to scan. Shiny or glossy materials also reflect their surrounding environment, and therefore environmental reflections may reflect back into the camera, causing tracking difficulties during the scanning process.

- *The camera sees and tracks the object in real-time. The Camera 3D software must be able to distinguish a unique view in order to track and recreate the geometry of an object being scanned.*

  1. A perfectly symmetrical object (e.g. a soccer ball) does not appear unique from one side to another, and therefore the camera software loses tracking and cannot rebuild the model.
  2. Objects that are too narrow or too small do not provide enough surface area for the camera to track – it's impossible to put a measurement to this variable, since there are many others involved, but as a rule of thumb, one sheet of paper in width is definitely too narrow, but a notebook size width might work. **The best way to find out is to try.**

- *The Camera 3D software works by "seeing and keeping" everything in its view that is static, and "seeing and removing" everything in its view that is moving, in any given frame. If an object has moving parts, the camera will put them in the latter category and try to remove them from the model.*

  1. Always secure any moving parts with sticky tack or tape, before attempting to scan.

- *The field of view (FOV) of the camera determines the largest size object that scans completely.*

  1. Objects that are outside of the camera's FOV will not be able to be added to the model.
  2. In the Camera 3D WorkTool, a guiding circle will turn green if the camera can see the object placed under it, however this is only the first guideline, as the object is still subject to the property and size limitations listed above.

Product Availability

Is this product available worldwide? When will it be available worldwide?

At the moment, it is available in the US only, although there are plans to expand the offering to additional countries worldwide. We will be releasing expanded geographies throughout 2018.

What is the price?

$599 USD

Where can the HP Z 3D Camera be purchased?

The product will be available in May 2018, from the HP Store and Amazon.com. At the moment, you can pre-order at Amazon.com:
https://www.amazon.com/dp/B078W3Y2GH

What warranty does HP Z 3D Camera carry?

One-year, worldwide parts-and-labor limited warranty. 24/7 technical support

Where can I get more technical and detailed information about this product:

More information, including Datasheet and Quick specs can be found at:
www.hp.com/go/hpz3dcamera