

WELCOME TO THE NEW OFFICE

Whitepaper:

Beyond Built-in: Why a Better Webcam Matters

How to Uplevel Your Ability to Connect, Communicate and Collaborate
Using Your Laptop or PC

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Introduction

The ability to virtually communicate and collaborate instantaneously with colleagues, partners and customers regardless of location is sweeping today's business world. Video calling, video conferencing and unified communications are replacing face-to-face meetings, reducing the need for business travel. More importantly, since collaboration is instantaneous, businesses and individuals are realizing real improvements to productivity.

Seeing who you are talking to, rather than just hearing, enhances the experience of connecting with others exponentially. For the virtual experience to be as close to the real in-person experience as possible, the choice of webcam is important. Quality of webcam components and optimizations can vary widely, ultimately translating into overall experience quality.

Comparing Embedded vs. External Webcams

You may ask, as many people have, "Why should I invest in an external web camera when my computer has one already?" Embedded webcams can be useful, but technical and cost factors can limit performance when compared to external or "plug-and-play" webcams.

Here is how the two types compare by attribute:

	Embedded Webcams	External Webcams
Cost	As the laptop/PC market is highly competitive, built-in webcams are likely to be basic.	While they necessitate expense beyond a laptop or PC, external webcams are apt to have higher quality components that allow for fine tuning.
Size of Components	Embedded webcams are typically small; small components directly impact the level of camera performance and image quality.	Since their design is not dictated by space constraints, external webcams typically have higher quality components, providing for better resolution, speed, fluidity, color balance, and noise reduction.
Lens	Embedded webcams do not have room for a multi-piece lens stack, so image quality may not be the best.	Some external webcams have a multi-piece lens stack, greatly enhancing their level of image quality.
Focal Length (Focus/Defocus Ability)	As embedded cameras typically don't have multiple lens components, focal length is limited, making images in shorter distances not as crisp.	Higher quality external webcams have autofocus and can adjust focal length for near or far so that the subject is always in focus
Field of View	The field of view offered by embedded webcams is most suitable for one-on-one communications.	External webcams typically allow for a wider field of view, so more than one person can participate at any endpoint.
Light Sensitivity	Embedded webcams may not adjust or fine tune in lower light environments, causing reduced image quality.	Some webcams can fine tune in lower light environments to generate better quality images.
Ability to Position	Embedded webcams provide little freedom to adjust camera position and minimize the scene to one view, such as a face.	Being able to position and adjust a webcam as desired is integral to business-grade video calling. External webcams typically provide this functionality with varying clip technologies.
Heat	Heat generated by a laptop can affect the sensor of an embedded webcam or increase noise in an image.	External webcams are usually larger, with space around the circuit board to allow heat to disperse.
Stereo Quality Sound	The quality of microphones embedded in computers varies, according to microphone location and the overall computer solution.	Some external webcams have built-in stereo microphones offering a high definition-like audio experience.
Certifications	Embedded webcams are often not designed to perform to certification standards for video calling platforms.	Some external webcams are built to work seamlessly with top video calling platforms. The resulting certifications help ensure that cameras offer speed, performance, quality, and other enhanced features to enable a quality experience.

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Evaluating Webcams for Business-Grade Video Calling

In addition to some of the more obvious ways to evaluate external webcams for business video calling and unified communications, there is another level of factors to be considered for the best possible experience given cost and quality objectives.

Understand Many Factors Influence Quality and Performance

To ensure maximum quality and performance, look beyond sensor size, resolution and frames per second. Additional factors that contribute to a webcam's overall image quality and performance in your video calling or unified communications environment include:

- Lens and optical components
- Application optimization
- Fluidity
- Low-light performance
- Field of view
- Autofocus

Evaluate the overall specifications of a webcam before you buy. Trusted brands often offer top notch solutions across a range of price points and fine-tune their solutions for the best-in-class professional video calling. Also, a webcam with a larger optical footprint – specifically sensor and lens – produces better images.

Minimize Noise: the 30/30 Rule

In general, look for a webcam that supports a performance of at least 30 decibels for temporal and spatial noise, and 30 lux. These levels result

in less noise and better adjustment to varying environments. Also at these levels, the webcam needs to stay fluid at a target of at least 24 frames per second or more. If the webcam vendor does not provide this level of data in the product listing, be sure to inquire about these specifications.

Ensure Camera is Plug-and-Play with Your Video Calling Application

A key factor for business purchases is ease of use and deployment – in this case, plug the webcam into a laptop or PC and it works in your calling application without software installation or having to adjust settings. Although your application may require settings around supported peripherals, the webcam itself should ideally work plug-and-play using a USB port. Even better is a webcam that is specifically tested or optimized for use with your video calling or unified communications application.

Seek a Certified Camera Where Possible

Even though most laptop and PC webcams are USB video class compliant, if a webcam is certified or optimized for your application, you are on the road to having an optimal experience. For instance, a webcam may claim that it can support up to 30 frames per second, but if not optimized for a particular application, the speed may only reach 20 frames per second or fewer in lower light environments. Optimizing a webcam to work with a unified communications application helps ensure superior performance around fluidity, colors, noise and many other factors – even sound quality. For example, Microsoft® Lync™ offers



a webcam certification program to ensure that webcams are delivering the best possible experience when used with Lync. Webcams that have gone through this stringent testing process are identified with an official Optimized for Microsoft Lync wordmark.

Enjoy a Wider Field of View

Business users need their video calling solution to be flexible; during a video call they may need to invite others, draw on a white board, show products, share presentations, and even move around. The overall quality of the call is infinitely better with a wider field of view, and a webcam that can provide that experience can also be dual purposed for a small conference. Seek a webcam that provides at least 69 degrees of diagonal field of view; for optimal viewing, 77-78 degrees field of view is much better.

Consider the Impact of Light

Lighting is a critical component of the professional video call. Light levels can vary from room to room, and from participant to participant depending on where they are in a room. Backlight can be a huge

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problem, as when desks are located in front of windows. A webcam should adapt to your light levels – not the other way around. For optimal performance, look at webcams that have invested in a protocol for low light environments, such as Logitech’s RightLight2™ technology. Otherwise, your video call may be left in the dark.

Don’t Forget the Camera Lens

In addition to resolution, the webcam components and the optical lens are important elements that are often overlooked. To obtain that clear, “it’s-almost-like-we’re-in-the-same-room” experience, select a webcam with a superior lens solution, such as Carl Zeiss® optics. To help ensure your image is clear at close and farther distances, also make sure the webcam is equipped with autofocus,

which automatically adjusts the webcam focus to your distance from the webcam.

Realize Sound Quality Matters

If the sound quality in your video call is lacking, it doesn’t matter how superior the image quality is – the conference call is compromised. Make sure the webcam you choose boasts superior audio quality through dual stereo microphones. For speakerphones, headsets and other sound solutions that accompany your webcam as a total video calling solution, there are benefits in purchasing from a single vendor for purposes of compatibility testing, certifications and support. For instance, Logitech provides a full range of laptop/PC webcams, headsets, speakerphones and speakers that can integrate easily with your set up.

Choose Webcams Designed for Business

If the vendor has truly targeted business users, features such as plug-and-play, unified communications application testing, office environment testing, multi-party calling, focal length, and a design that looks good and fits well on monitors of varying sizes have all taken center stage.

Invest in Brands you can Trust

The investments you make for your business are intended to help save or make money in the end. While it is important to make good product choices, it is also important to choose brands that stand by their products. A trusted brand delivers the product quality and support your business needs to help make you more successful.



PC embedded webcam (left) versus external Logitech B910 HD Webcam (right), both taken with identical settings on the laptop.

The B910 image (right image) offers correct contrast and color saturation. For instance, looking at the shirt in both images, you see true black and white color in the B910 image (right image), as opposed to shades of grey in the embedded webcam image (left image).

The image on the right is also sharper, with better lighting and greater horizontal and vertical field of view. In addition, there is less noise in the B910 image, which you can see readily by comparing the blue wall in the background with the embedded image on the left. The B910 webcam (right image) also allows the subject to be seen at a better angle while on the video call.

For the Serious Evaluator: Setting Up Your Own Test Environment

If you want to take your webcam evaluation to another level, here is a guide to help you create a “lab” for optimal testing. You can compare two webcams with two laptops or PCs side by side to view any differences that will help you make your decision – one of them could be an embedded webcam, the other an external webcam.

Here’s what we recommend:

Setting up the Test

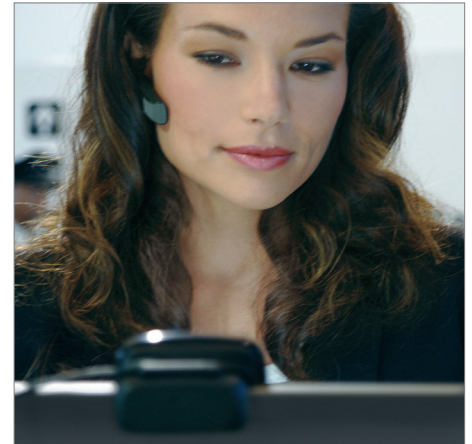
- 1. Find an office or conference room** - To simulate a proper testing environment, it’s always best to find an area where you can close the door and control the lighting.
- 2. Close the shades or curtains and dim the lights** - How the webcam operates under low light conditions is an important element of camera quality.
- 3. Plug in the webcam and start your application** - Many video calling applications allow you to open a test window to check your video or settings. To go a step further, test in an actual video call with a colleague in or outside your office.

Performing the Test

- 1. Check the fluidity of motion**
After starting video, move around or walk back and forth in front of the webcam – even better is to have another person walk in front of the webcam while you observe the motion on the video screen. If the frame rate is not high

enough, then the movement will not be as fluid. While this is just a short test, in longer video calls, lower frame rates can become an obstacle to good video calling. There are also software tools out there that measure frame rate during video streaming.

- 2. Check for noise or artifacts**
Look closely at the video screen in front of you. Do you see any moving pixels, jitteriness, or artifacts that look out of place or distort the image?
- 3. Check the colors**
What is the accuracy of the colors on screen compared to the colors of the actual objects? To perform the most accurate test, place brightly colored-paper or other objects in your viewing area or have you and your testing colleague wear multi-colored shirts during the tests.
- 4. Check the field of view**
Are you seeing a wide enough field of the scene in the video window? Comparing field of view is especially apparent when testing between embedded and external webcam solutions.
- 5. Sharpness of the image**
Viewing objects closer to and farther away from the webcam is important in evaluating image sharpness. Test this by moving closer to and then away from the webcam, and in a video call, have your colleague do the same. Do the images remain sharp, and does the camera autofocus when close or far? Also, look at the level of sharpness from corner to corner of the video screen.



- 6. Low light sensitivity**
Under the dimmed lights in your test environment, how bright or illuminated is the video screen? Even in more brightly lit environments, different webcam solutions can produce lighter or darker video output. Since the person on the other end will want to see you and objects in view clearly, you will want to ensure that the brightness is adequate.
- 7. High Definition formats**
Finally, if the webcam says it is capable of high definition (HD), make sure it is outputting HD in your video calling environment. If the video window is very small, it is often harder to tell if it is running in HD.

The lack of HD is readily apparent in the image quality when the window is bigger or in full screen. If you are able to in your application, enlarge the video window or go to full screen. If the webcam is not running in HD mode, the image should be blurry and might even look like you are under water. If it is running in HD, the image should be crisp.

Conclusion

In the end, webcams are an important component of your company's video calling solution. Good webcams can provide a means to improve company communication and collaboration and help save on travel costs. The best webcams offer you the experience of "like being in same room."

Logitech for Business offers a variety of professional laptop/PC webcams that provide the qualities needed for a superior video calling experience. Logitech offers:

- Webcams designed especially for business, with certifications from popular video and unified communications applications.
- Optimal designs for business, with webcams that allow for positioning at multiple angles and on multiple monitors.
- The highest quality sensors and optics across all price points.
- Fluid HD video calling and features such as wide field of view and focal depth, light adjustment depending upon the environment, and razor sharp images with autofocus and Carl Zeiss lenses.
- First-class performance in unified communications environments for both video and audio.



Logitech B910 HD Webcam

For More Information

We hope you found this guide helpful and will visit us at www.logitech.com/thenewoffice to check out our business webcams and other products.

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