



White Paper

What Separates Professional PTZ Cameras From the Rest of the Pack:

Cut Through the Hype with 6 Key Elements



Executive Summary

The Pro AV market is large and crowded for organizations looking to select their next PTZ camera. COVID-19 has created an urgency to move fast and deliver solutions that can solve your needs to capture, record and stream content for your audiences. In fact, Nielsen data reveals consumer streaming viewership has **increased 85%** during COVID-19 and the impact is also tremendous on video use across industries. At the same time, claims about PTZ camera features add confusion to what is real and what is truly important in your assessment. In this paper, we will review the terminology and cut through the hype with six key elements to reveal how not all PTZ cameras are created equal.



A Look at PTZ Camera Terminology

For organizations just starting a review process for new PTZ cameras, it's important to understand some key terms. We'll name just a few of the most relevant ones that can help separate some PTZ cameras from the rest. In fact, the term **PTZ or Pan-Tilt-Zoom camera** applies broadly across models of differing sophistication and applications. A surveillance camera, a video conferencing camera and a professional grade live streaming camera are all PTZ models but far different in scope, features and price. In the following section, we'll explore some of these PTZ camera terms for better understanding.



- **Auto Tracking:** Based on video software and algorithms, auto-tracking is function of a PTZ camera that allows it to automatically detect and follow a moving object such as a speaker on its own without human commands.
- **Output Resolution:** Resolution greatly impacts the image quality of videos. The higher the resolution, the clearer a video will be on a stream. Greater resolution also increases the size of a video file. Video resolution is measured by pixels as units defined by width by height. The most common resolution is High Definition (HD) at 1920 x 1080 and Ultra High Definition or 4K at 3840 x 2160.
- **Optical Zoom:** Involves changing the focal length of a camera by physically moving the zoom lens. This allows one to magnify objects from far away and capture in the full video frame.
- **Digital Zoom:** Involves in-camera image processing by cropping and enlarging the image once it has been captured by the digital camera's sensor. The camera takes a central portion of the image and enlarges it to simulate optical zoom.
- **PTZ Control Protocol:** The numerous methods of controlling a camera's pan-tilt-zoom commands and video settings by transmitting communication data defines its protocol. For example, VISCA control via RS-232 cable connection provides advanced control of the camera. IP control such as Ethernet allows for PTZ control over a network or the Web.
- **IP Video Streaming:** An IP (Internet Protocol) camera is a networked video camera with its own IP address that transmits data over Ethernet. These cameras can stream live video content for online viewers over local area networks or outside networks for public broadcasting.

6 Key Elements Reveal How Not All PTZ Cameras Are Created Equal

1. The Difference with True Auto Tracking

Auto tracking cameras are not all created equal. There are many PTZ cameras on the market today of the professional AV grade and more basic ones for video conferencing that claim to feature auto tracking. This is somewhat misleading, and the difference is in the details. True auto tracking cameras track the motion of a presenter using built-in software, no other tricks. Let's explore the subtleties between auto tracking and zone tracking as well as the different methods used to achieve effective motion tracking.

While auto tracking cameras employ algorithms to fluidly follow motion without human operation, zone tracking is usually included in the category. Zone tracking allows one to create preset shoot areas that the PTZ camera will focus on when the presenter moves to that zone for immediate recognition and tracking. Zone tracking is useful when there is presentation content or multiple areas of a room or stage frequently visited for quick focus and a multi-camera feel. Zone tracking is commonly confused with auto tracking as the camera does "follow" the motion of a person until he or she moves to a specific area of the room or stage.



Within auto tracking itself there are other elements that distinguish some PTZ cameras from others. Early technology for this technique centers on following a physical lanyard so the camera can make a connection and focus on the person carrying it. While the lanyard can be effective as a tracking device, it is susceptible to being lost in busy environments and does little when introducing new speakers to the stage to track. Voice recognition is also used as a method to track a speaker. Many video conference room cameras use voice as the catalyst to zoom in on the person who is talking. These technologies all have a place, but are not designed

to handle tracking speakers, sometimes multiple ones, in such large presentation environments in higher education, houses of worship, healthcare, or enterprises. Modern auto tracking with built-in firmware that harnesses facial features tracking or body tracking that can switch to other presenters allow greater freedom and better accuracies in video communications. They also free up the need for a professional camera operator to intervene.

2. Which Zoom For Your Room?

360X zoom. HD zoom. Total zoom. Digital zoom. Optical zoom. It can be difficult to understand what number or measure to follow when examining the zoom of a professional PTZ camera. Some manufacturers have taken to blurring the issue and hiding the real value of a camera's zoom with marketing terms or simply stating the total zoom of a camera. Total zoom basically equals optical zoom x digital zoom. For example, a 10X optical zoom, 12X digital zoom camera could be promoted as having 120X zoom. It's technically correct but hides the more important measure of a PTZ camera.

Optical zoom, as we previously defined, is a more important factor in determining the quality of video projects along with a few other things such as resolution and streaming bandwidth for live productions. While optical zoom does not change the resolution of your object, it brings it into better focus and allows you more options in the placement of the camera from the distance to the presenters without compromising image quality. Lecture halls, classrooms and larger training rooms require a camera with an optical zoom that can shoot at least 12 to 50 feet away from the target. Be wary of web cams or conference cameras that claim to be able to operate outside of their intended environments. As you can see below, there is a tremendous difference and experience for remote audiences between low and high optical zoom settings.



Digital zoom on the other hand, is your camera's software at work with digital processing to alter the image. As others have stated, digital zoom is an **"invention of digital video cameras"** and it enlarges the target image which can blur or degrade the quality of the video. While this type of zoom has its uses, to produce high quality video with live streams, optical zoom is the only true measure to review.

Based on what I now know, and I select a camera with "real" auto tracking and strong optical zoom, I should be okay, right? Well, there are still more things to consider for your own production environment. How you will connect and control the camera(s) are incredibly important aspects of a camera in order to deliver professional productions. In the next three sections, we'll review essential outputs, control protocols and speed control for a PTZ camera.

3. Outputs Give Options

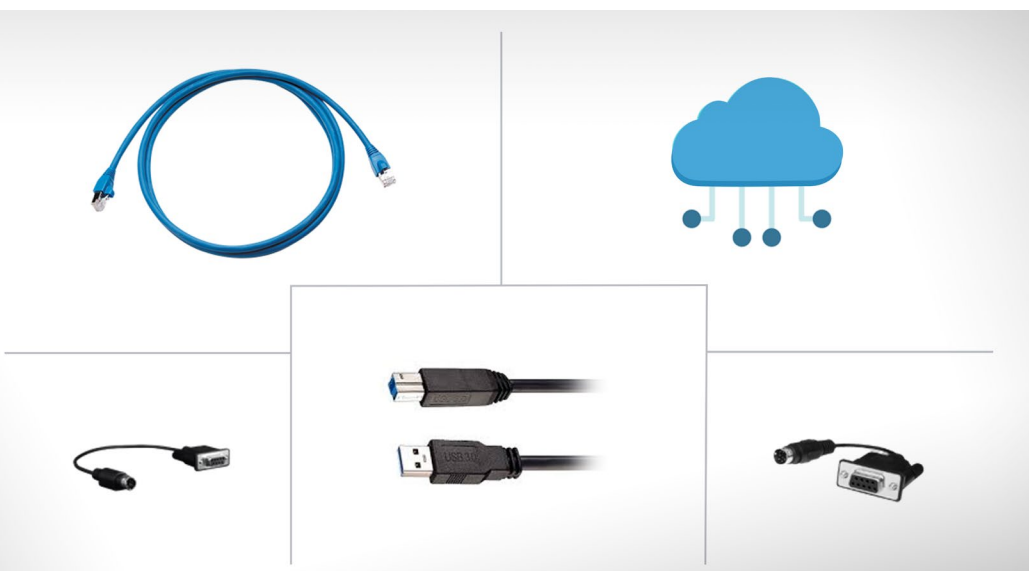
Some cameras only have one or two outputs while others provide multiple options. The connections will reveal the freedom or limitations you can have with live productions. For example, if USB is all that you require quality-wise that's all you need to consider. For most AV teams, the requirements are broader. Most typical camera outputs include SDI and HDMI in order to connect to live streaming equipment such as a switcher or an encoder. An IP or Ethernet output is also favorable to directly connect to networks and allow content streaming. Look for PTZ cameras that offer more output options to suit your growing production environment.



4. Control Protocols

There are several control protocols to consider as well including VISCA, Pelco-D, Pelco-P, and CGI(IP). VISCA was created by Sony and is based on RS232 Serial

communications between camera and PC. Pelco-D/P are other standard communication protocols that are used for RS422 pan-tilt-zoom control of PTZ and CCTV cameras with joysticks and computer DVRs. IP cameras can utilize CGI commands through an http client server or other web application to control the camera, but has a limited command set. How important these options are your organization and ability to connect, control and stream your video content is up to you. Being able to control multiple cameras via IP or with a physical controller simultaneously is also important for AV operators, so ensure your model can be supported by such a device.

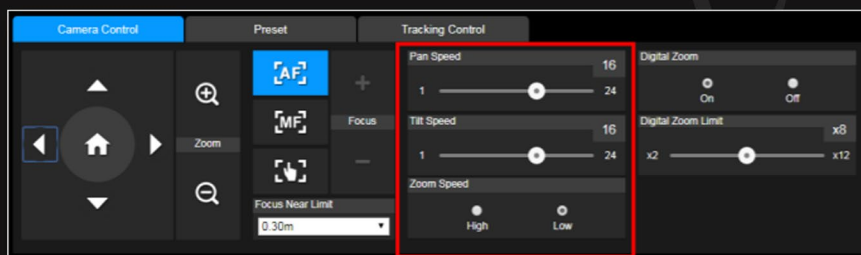


In addition, there are also network control protocols such as **NDI® (Network Device Interface)** and **NDI@|HX2** from NewTek and streaming protocols such as **SRT (Secure Remote Transport)**. **NDI** is a high performance standard that allows anyone to use real time, ultra-low latency video on existing IP video networks. **SRT** is an **open source video transport protocol** developed by Haivision that enables the delivery of high-quality and secure, low-latency video across the public Internet. Cameras that can take advantage of these types of modern standards can open new methods to control cameras and broadcast your video.

5. Pan-Tilt-Zoom Speed Control

As we reviewed earlier in this paper, not all PTZ cameras are created equal and there are several elements that separate professional-grade from surveillance or conference room devices. Often overlooked but essential in productions where there is need for movement, multiple presenters, and preset shoot zones is the pan-tilt and zoom speed control of your PTZ camera. What is normally available on a typical conference USB camera series is a slow, noisy and less smooth movement to pan or position the camera professionally.

Being able to establish preset angles and to pan and tilt the camera in precise degrees or zoom at variable speeds via remote control or autonomously can make a huge difference in your video. For example, some of the new generation of AVer auto tracking cameras have a pan-tilt speed of 0.1° 100°/second and a preset speed of 200°/second. Most PTZ cameras that are not intended to be used outside of a conference room will not even state their pan-tilt speed.



6. Software Makes it Easier

There are many excellent Cloud video software platforms available on the market today to make it easier to stream, share and manage your video. Solutions like **Echo360**, **Kaltura**, **Panopto** are just a few of the tools for video recording, live streaming, search and content management used in higher education and enterprises. Look for recommended cameras from these partners to know their software is highly compatible with them. Other social streaming and video conferencing solutions such as Facebook Live, YouTube, OBS, vMix, Microsoft Teams and Zoom can provide good options for organizations of all sizes to stream video to many or a designated few. Not only should a PTZ camera work easily with these different types of platforms but it should also offer its own free software to manage your camera via PC and Web.

For example, **AVer PTZ Management** is free value-added Pro AV software for operating multiple Auto Tracking and PTZ cameras on PCs or laptops. Operators can fully control AVer PTZ cameras with a user-friendly interface that allows one to toggle between cameras, adjust positions, speed, zoom, activate presets and auto tracking modes. The remote management of the PTZ cameras is also a timesaver as it extends to editing settings and upgrading firmware across 128 cameras at once which makes things easy for AV managers. The software also

provides complete visibility of PTZ cameras and IP addresses on the network with a quick search feature.



Conclusion

There are many mixed messages about what's important when it comes to PTZ camera features. Reviewing the six key elements outlined in this white paper can help you to clarify what's important and make fair comparisons between cameras designed for similar use cases to capture and live stream professional video content. Remember to select a camera that addresses the needs of your organization, your AV environment with the versatility to offer the control and management online and with various systems.

Contact AVer today, the leader in video streaming and learn about how you or your customers can start streaming video with any of our Auto Tracking or Professional PTZ Live Streaming cameras.

About AVer Information Inc.

AVer is an award-winning provider of video and collaboration solutions that improve productivity and enrich lives. Our Pro AV product portfolio includes cutting-edge auto tracking cameras and PTZ live streaming cameras to serve any presentation, training or lecture environments. We strive to provide industry leading product quality, service and support that exceeds our customer's expectations. We are also deeply committed to our community, the environment and employ stringent green processes in all we do. Learn more at pro.averusa.com.

Why AVer?

You demand excellence in video performance. AVer delivers the highest value, product quality and features with advanced auto tracking and live streaming ready professional PTZ cameras. With auto tracking functionality you can save production time and money without the need for an experienced camera operator. Easy-to-use with built-in software, integration with other popular platforms and simple set-up, AVer offers a truly plug-and-play experience to stream your live video. We understand your presentations and events cannot afford any downtime, and neither can your video cameras. That's why we developed AVerCare, the industry-leading 3 year warranty with free RMA shipping and 24 hour replacement time to keep your video projects up and running.

From the moment you meet AVer we want to make sure that your experience with us is enjoyable and satisfying. With our free US-based, live phone email and chat technical support, free product training and unrivaled warranties, AVer serves as your partner rather than simply your vendor.

- **Exceptional product quality and innovation with advanced auto tracking functionality and live streaming-ready cameras**
- **Committed to serving our partners and customers – pre and post-sale**
- **Pro Evaluation program and industry-leading AVerCare 3 warranty with free RMA shipping and 24 hour replacement**
- **Pro AV cameras are 100% TAA compliant**



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