# Selecting the video camera

*In order to select the video surveillance system correctly, you should clearly define the range of tasks to cope with. If you know the hardware requirements and allocate the budget, you can proceed to select the main elements of the system: video cameras and DVRs.*

Here we would like to focus exactly on video cameras, as the unprepared people face the great problem of selection because of the huge variety of video cameras. You can find a lot of guides on the selection of these devices on the Internet, and we also offer you our own mechanism on the selection of the camera you really need.

Before dwelling on any model, you should decide on the standard of your video surveillance system.

## IP camera or AHD camera?

| IP video cameras | AHD video cameras |
|---|---|
| + Support of video resolution of 5 MP and more<br>+ Ability to record without a DVR. For example, in the cloud directly from the camera (Partizan Cloud Storage) or on the built-in memory card<br>+ It is convenient to build the distributed systems as the direct camera - DVR connection is not required<br>+ Digital video can be analyzed and processed with the help of professional software (for example to recognize license plates, faces, etc.)<br>+ Ability of wireless video and audio transfer over Wi-Fi<br>- Relatively high cost of the system<br>- Small delay of transmission signal<br>- Knowledge of network administration is required to configure the system | + Relatively low cost of the system<br>+ Simple configuration based on the principle "connected and operates"<br>+ Full compatibility of equipment of the different manufacturers within the same standard (AHD, CVI, TVI – and some Partizan models support all the standards)<br>+ No delay of transmission signal<br>- Limit in resolution up to 4 MP<br>- Required availability of DVR, hard drive, and power supply<br>- Only for local placement of the system with a limited distance from the cameras to DVR |

**IP video cameras**

The usage of IP video cameras is justified if you need to obtain a high-resolution video image with a sufficient level of detailing of small items – faces, money, car license plates, etc. or as the low-price variant while connecting to the Partizan Cloud Storage service in which all the system consists of a single video camera.

The high resolution and, consequently, a quality of the system are the main advantages of IP video cameras. The IP video surveillance system can also consist of cameras located at large distances from each other and from the DVR. Unlike analog systems, the IP cameras do not have to be installed at a distance of no more than several hundred meters from the DVR. You can connect the IP video cameras to a local network of any size.  So, the network routers and optical fiber help to measure the distance from the IP camera to the DVR in kilometers without loss of signal quality.

A great advantage of IP cameras is also the ability of wireless data transfer over Wi-Fi. Such variant of connection is not recommended for serious security systems due to its instability, but it can be  a  variant for home users. In any case, you will need a conductor to connect a camera to a power source, but finding an electrical outlet near the camera is usually much easier than connecting it directly to a router or DVR.

But there are also drawbacks. For example, small delays of video signal transmission: you can see the picture not in real time, but with a little delay because of the peculiarities of digital video transmission technologies over the network. This may become a problem in cases when it is necessary to react to the event as quickly as possible. And of course, the connection of an IP surveillance system requires skills in the

field of administration of local network, that's why it is better to entrust the start-up and adjustment work to professionals.

Exceptions to the rules are only Partizan IP video cameras: CloudCubic, CloudRobot, CloudBullet, created especially for self-installation by any home user. The kit of these models includes everything you need and the connection of the camera to the cloud does not require any special knowledge. If you do not have a Partizan Cloud account, you can just use the program CloudMaster to configure the camera step-by-step and to add it to your new account. If you are already registered user, you can add a new camera by scanning the QR code posted on its package.

**AHD video cameras**

If a high detailing is not important, AHD video surveillance fully justifies itself: it is cheaper and easier to configure. In addition, new models of analog video cameras with the resolution of 4 MP have already appeared corresponding with the level of IP equipment with the size of the image of 2592x1520 pixels.

The main advantages of the analog cameras are the simplicity of connection and minimum settings. You do not need special engineering knowledge, as everything is simple and available. After connecting one end of the cable to the video camera, and the second - to the DVR and the power supply, you will immediately see a picture on the monitor. The analog systems' advantage is also the transmission of the video in real time without any delays – you see everything happening at this moment on the monitor. This is especially important for a quick reaction to the occurrence of any unpleasant event.

There are also the disadvantages: the analog system is local. The cameras are mounted in close to the DVR – at a distance of up to 500 meters. All additional devices are also required: DVR, hard drive, power supply and cable. AHD video cameras cannot be connected over Wi-Fi.

**What resolution is better to choose?**

| 2MP and less | More than 2MP |
|---|---|
| + Fast data transfer over the network<br>+ Recording with a high frame rate<br>+ Small amount of occupied space on the hard drive<br>+ High photosensitivity<br>- Small detailing of the objects on the video<br>- Impossibility of deep scaling of the video image | + High detailing of even small objects<br>+ The possibility of deep scaling with the preservation of video quality<br>+ Relevance of the camera for longer service life<br>- High cost<br>- High requirement for network equipment and data transmission channels<br>- High cost for storing the video archive, as it takes up more space |

**2MP and less**

If the video surveillance system has no tasks concerning the maximum possible detailing, so there is no point in ultra-high resolutions, the FullHD (2MP) is enough. Such video cameras do not cost much today and the picture is decent. If you have limited budget – use the models with the resolution of 1MP. Partizan offers you the assortment of many different models with this resolution, all of them provide a good quality of the image and they do not cost much. For example, the best-sellers in this segment are the Partizan AHD camera COD-331S HD 3.1 and IP Cloud Cubic camera with the same resolution.

**More than 2MP**

The high-resolution video is really good: the precise video detailing and the ability of image scaling without significant loss of quality are really indispensable for serious objects, for example, in financial institutions where the exact identification of faces, documents and banknotes is required. But you should remember that the more megapixels the camera has, the higher are the requirements to the rest of infrastructure:

cheap home routers and low-quality cable are not suitable for such cameras. And you will require more hard drives to store the archive.

**Determine the type of housing**

| Internal (cubic) | External | Dome | Robotic (SpeedDome) |
|---|---|---|---|
| + Simple installation<br>+ Small dimensions of the camera<br>+ Low cost<br>- Not strong housing<br>- Minimal protection against dust and moisture | + High-strength housing<br>+ Protection against dust and moisture<br>+ Long range of infrared illumination<br>+ Convenient adjustment of the position and angle of view of the camera<br>- Relatively high cost<br>- Difficult mounting | + Convenient design for installation on the ceiling<br>+ May be internal or external<br>+ There are cameras with anti-vandal housing<br>- Difficult mounting | + Remote control of camera view<br>+ Reliable components of the housing and mechanisms<br>+ Availability of intellectual functions<br>- High price<br>- Large size |

The choice of the camera is based on the requirements and tasks of your video surveillance system. If the system is required for internal video surveillance, it makes no sense to buy outdoor models, which have the housing of a large size and it will look ridiculous in the interior of a flat or a house (except for warehouse, industrial and non-residential premises). Conversely, internal models can not be used on street and in industrial premises as a high humidity and dust will promptly damage the cameras.

**The internal video cameras (cubic type of housing):** The advantages of such type of the housing are – small size, good functionality and simple mounting – the camera can be put on the table without fixing, like the model Cloud Cubic IPC-1SP-IR EC 1.0. The disadvantage of these cameras is only housing, it is made of plastic without a protection against water and dust.

**The external video cameras (bullet type of the housing):** An excellent solution for installation on street or in the industrial premises - the housing of the video camera is made of metal with the protection against moisture and dust. The external video cameras are also equipped with a reliable mounting mechanism and 3-axis bracket that helps to adjust the position of the camera as precisely as possible. One of such models is COD-VF3CH 3.3 FullHD. The disadvantages of such type of housing are a large size and complicated mounting. The qualitative installation of the camera and conductors is required to avoid the penetration of moisture to the contacts. To adjust accurately the viewing angle or focal length a partner's help is always required.

**Dome video cameras:** The perfect solution for ceiling mounting both indoors and outdoors, for example under an awning. The Partizan product line has internal models of plastic domes and external metal domes with a durable housing and anti-vandal protection, for example, IPD-VF2MP-IR SE POE. The design features of the dome housing are made with the rotated in any direction module to choose the most suitable viewing area. The only disadvantage is a difficult mounting as you should completely disassemble the housing during the installation.

**Robotic video cameras:** They can be indoor and outdoor, but they are used on large video surveillance objects, where full coverage of the territory and the ability to track the moving object is required. One such video camera is capable of substituting for several common models. They are equipped with qualitative components and rotary mechanisms as well as intelligent functions for analyzing the video image. The main drawbacks of these models are high cost, large size, and weight. The exceptions are some indoor IP video cameras which have the rotary mechanisms in the small-sized housing. For example, Partizan Cloud Robot has a small size, fits perfectly on the desktop, but it can also be controlled remotely using Partizan application, rotating to an angle of nearly 360° horizontally and almost 120° vertically.

**What lens is better to choose?**

| Fixed | Varifocal (manual setting) | Varifocal (motorized zoom) |
|---|---|---|
| + Low cost<br>+ Does not need an adjustment<br>- Constant angle of view that cannot be changed without changing a video camera or lens | + Ability to adjust the angle of view of the video camera<br>+ Viewing angle can always be changed (manually) due to the requirements and tasks of video surveillance<br>- High cost<br>- It is difficult to adjust precisely, especially in IP video cameras with high resolution and with the possibility of video signal delay<br>- Defocusing is possible due to the change of temperature or external influence | + Similar to the previous<br>+ Remote control and camera focus adjustment<br>- Higher cost |

**Fixed lens:** is the most widespread type of lenses with the focal length that can not be changed. The advantages of such type of lens are an acceptable cost, high lens speed, and absence of adjustment. The drawback is the single viewing angle and if it does not suit you, then you should change the camera or the lens.

**Varifocal lens (manual setting):** It is also a popular type of lens but with the manual adjustment of the range and angle of view. A universal solution suitable for almost any task: for the general view (yard, room), and for detailed video shooting of a specific area – cash desk or front door. The disadvantage is higher cost compared to fixed models, but this camera may be re-installed on another object that requires a different viewing angle. The best-seller among the cameras with the varifocal lens is, for example, IPO-VF2MP SE POE 1.0.

**Varifocal lens (motorized zoom):** The most expensive type of lens with the remote regulation of the range and angle of view. Such type of the lens is used in robotic video cameras SpeedDome, but it can also be used in bullet housing, as in the model IPO-VF2MP AF POE. The main advantage of such lenses is the special engine which provides the remote control of the lens elements and precise adjustment of focal length. There is only one drawback - its cost. It is higher than the price for fixed and varifocal lens with manual adjustment.

In general, the choice of the lens depends on the budget, the task and the objects of video surveillance. When it comes to video surveillance of 10-15m territory around the house, a small shop or not large office rooms, then it is enough to install the camera with a fixed focus. If the distances are longer, or there is a chance that you will need to change the angle or distance of view, it is better to take a camera with the varifocal lens. The online PartizanStore networks offer you ready-made kits with video cameras, equipped with a varifocal lens and they have a prefix PRO in the title. Therefore, it is quite easy to distinguish them. Finally, if your budget is not limited and you want to choose the best device, or if your cameras are far /high and it is difficult to adjust the lens, so we recommend you to use a varifocal lens with motorized zoom. This allows you to control the angle and range of your camera's view directly from your phone or computer. In this case, the process of adjustment is very easy and you save your time for serving the system.

For your convenience, we give here the table of focal lengths. Using it you will understand which angle of view you will get with your lens.

## *Here will be the table of focal lengths*

**Where to record and where to store?**

| Local recording | Recording in cloud |
|---|---|
| + Access to settings and archive without the Internet connection<br>+ No monthly payments for the use of video surveillance system<br>+ Possibility to connect additional security devices: sensors, alarms, etc<br>- It is necessary to purchase expensive components: DVRs, hard drive, memory cards<br>- Wear and tear of it as a result of its operation<br>- It is easy to steal/damage your data or the equipment<br>- Requires the regular maintenance service | + Instead of one-time purchase costs on components for video recording, a rental model with a small monthly payment is proposed<br>+ Protection of video data from theft, damage, breaking and unauthorized viewing<br>+ Personal access to the video surveillance system anywhere in the world from a smartphone, tablet or computer connected to the Internet<br>+ Simple and fast setup of the equipment<br>- Monthly fee for using the service<br>- Saving only if you have a small number of video cameras in the video surveillance system<br>- Constant camera connection to high-speed Internet is required |

**Local recording** to the hard drive of the DVR or computer is a preferable method for large video surveillance systems – from 4 video cameras and more. After investing money in such video surveillance system, you do not need to think about monthly payments for cloud services and also take care of regular Internet connection. This variant is also suitable for those who want to expand their security system by using additional security devices and actuating mechanisms.  But it also has disadvantages: the system of video surveillance may be stolen and not just a video camera but also a DVR with a hard drive. In addition to significant financial losses, you also lose the archive of video recordings, while the data is sometimes much more important than the equipment itself.  Such components as hard drive and DVR eventually reach the end of their service life and they require replacement.

**The selection of DVR:** analog or network DVR should be chosen taking into account the video cameras, or more exactly – their resolution and quantity. Small video surveillance system needs the device designed for 4 or 8 channels (video cameras) and even if you do not use them, the reserve of one or two cameras will be useful.

You should also think of the resolution of recording: having bought 2-megapixels video camera today, you would probably like to buy 5-megapixels camera in six month – as the new products' price is getting lower and this makes it easier of access.  In general, if you have an opportunity then it's better to buy DVR with a reserve of channels and resolution. This model will be current over a period of several years. The example of such variants is Partizan ADF-14S Super HD 4.2, with the resolution from 1 to 4 MP for analog video signal!

IP video DVRs are selected in exactly the same way, the only thing - they may be equipped with POE-channels. For example, IP video DVR Partizan NVM-421 POE has 4 independent channels PoE. POE channels in IP video DVR are used for direct connection of cameras and transmission of power to them, and transmission of the video signal from them via a single twisted-pair cable. This is very convenient because you do not require additional equipment, like PoE-router or injector, but their price is higher than the price of common models. In any case, the direct connection of IP cameras to IP recorders without POE ports is impossible. That's why we recommend you to choose IP video DVRs without POE in the case when the maximum resolution or the quantity of POE channels of video DVRs does not suit you. In addition, you should remember that the length of cable from IP camera to IP video DVR shouldn't exceed 60-70 meters for normal power and video transmission over one cable. You can extend this distance with the help of the usual IP model of DVR and separate POE-router.

The rest functionality of the DVRs in the form of audio ports, alarm inputs and outputs, RS-485 port for controlling the robotic video cameras and so on, it should be selected only according to your tasks and requirements. But you should remember that the more interfaces are in your video DVR, the more expensive it is.

**Recording in the cloud:** if you need a small video surveillance system for an apartment or office with 1-2 video cameras, it will not be profitable to purchase a large equipment kit for recording. It will be enough to purchase several cloud cameras: Partizan Cloud Cubic, Cloud Robot or Cloud Bullet and perform a remote recording, as well as data storing using the Partizan Cloud Storage service. This option is quite portable – if you often move, it is easier to transport and install one-two small cameras than the whole system with the DVR and several cable skeins. The common recording is much in demand when you should provide a reliable backup of the existing system. The local archive is additionally duplicated by parallel recording in Partizan Cloud Storage on the facilities with increased requirements for fail-soft and security. But if you have a large video surveillance system (for example, 8 or 16 channels), then recording to the cloud is not beneficial, so it can be used only with the option of increasing the level of security of the whole system. As you know, you have to pay for security not to pay for its absence later.

You should remember that you need a high-speed and high qualitative Internet for full-blown recording to the cloud, it is impossible without the Internet.

### The additional equipment and accessories

Every video camera requires additional equipment. First of all, these are cables and power supplies. If you want to install a small video surveillance system, pay your attention to the PartizanKit «all-in-one», as these kits are equipped with the necessary accessories, including cables and power supplies. The length of cable in such kits is up to 20 meters, and it is enough in most cases for home or office video surveillance. Some IP video cameras are also equipped with cables and power supplies, for example, Partizan cloud series: models Cloud Cubic, Cloud Robot and Cloud Bullet.

Not to forget to buy everything required for video surveillance system and not to become a victim of negligent sellers, we recommend you to check yourself with the help of a small check-list. So, what do you need for creating a turnkey system of video surveillance?

*Check-list*

| For analog system | For IP system |
|---|---|
| • Twin-axial cable for video transmission from each camera (or twisted pair cable with receiver-transmitter of the signal)<br>• Power cable for each camera<br>• Connectors (if you crimp the cable yourself)<br>**Attention!** There are ready hybrid cables 2 in 1 video+power of different length with pre-installed connectors in the Partizan assortment<br>• Cable for connecting the DVR to the internet<br>• Cable for connecting the DVR to the monitor (VGA or HDMI cable)<br>• Power supply for each camera or power supply one for all cameras + power splitter<br>• Hard drive for video recording<br>• Video cameras<br>• DVR | • «Twisted pair» cable<br>• RJ-45 connectors (if you crimp the cable yourself)<br>• Power for each camera: PoE-injector, if your camera supports the PoE technology, and if DVR doesn't support the PoE technology; POE-splitter, if your camera doesn't support the PoE technology, and DVR and router support it, POE-router, if your camera supports the PoE technology and DVR, doesn't support the PoE technology, POE camera, and POE DVR; power supply, if your camera and your DVR do not support POE technology<br>• Router (Wi-Fi optionally) or POE-router (if you need to power a camera directly from the router and your DVR doesn't support POE technology)<br>• Hard drive or memory card (optionally)<br>• Video cameras<br>• DVR or video server or network storage (NAS) or paid account in PartizanCloud |

The ideal solution for those who do not want to puzzle over the purchase of accessories is the purchase of video surveillance PartizanKit: they already have everything you need to connect and operate the system - from cables to the DVR and cameras. The only thing that should be purchased is a hard drive of the required volume (sometimes it is also sold as part of the kit!). At the moment, there are several types of such kits with different resolutions and camera types, for example, a combined set of 2.0MP Mixed set AHD-5 4xCAM + 1xDVR.

**Mounting**

| Self-mounting | Professional |
|---|---|
| + No need to pay<br>- Sometimes specialized tools are required<br>- In the absence of skills, the installation sometimes may be not very successful leading to incorrect operation or even equipment failure | + Guaranteed high-quality installation by a qualified specialist<br>+ There is no need to buy a specialized tool;<br>- High price<br>- It is difficult to find a qualified specialist |

Many customers underestimate the stage of installation and configuration of video surveillance cameras, considering it a simple mechanical work that does not require specialized skills and abilities. However, when it comes to installing video cameras, many problems can come to light, basically, all of them relate to the absence of tools, for example, the perforator or crimping pliers. An unskilled installation can also cause interference on the video image or even damage the video camera or bracket.

If you are not particularly friendly even with consumer electronics and you have are doubts that you will be able to install and connect everything - it's better not to try your luck and immediately involve a competent specialist in the installation. If working with technology was not a problem for you, then you can try to install the system yourself after having studied the instruction. Of course, the installation procedure can be completely simple taking up to several minutes. For example, if you purchase an internal Partizan Cloud Cubic or Cloud Robot camera. Their housing and the shape of the bracket can be placed without any problems on any flat horizontal surface. Put the camera on the table, plug it into the outlet and into the router, and then follow the Cloud Master tips on the computer - it will not take more than 10 minutes. That's the time you need to update the firmware completely, configure Wi-Fi in the camera to connect it to your new Partizan Cloud Storage account.

All ready-made kits and Partizan cloud cameras include mounting kits – several dowels and screws, a key and mounting pattern. These handy things allow you to start the installation of your video surveillance system immediately "out of the box", without an additional purchase in the building store.

 Important!!! Try not to install video cameras on metal surfaces, near sources of strong electromagnetic radiation and use only high-quality accessories - cables and power supplies.

These are the 7 basic questions, answering which, you will be able to clearly determine which video cameras you need and how they should be installed. It remains only to determine the amount of the budget and choose the most suitable models. In the end, you can reduce their number to the optimal 3 - 5 options.

In fact, the choice of equipment is not as complex as it might seem at first - spare it a little time and soon you will be able to give advice to your friends and acquaintances. Well, if you do not have time, desire or opportunity to deal with this issue yourself, contact the nearest Partizan office. Our specialists are glad to help you to choose the best variant of the turnkey security system.