Analog High Definition CCTV (AHD)
by NOVUS

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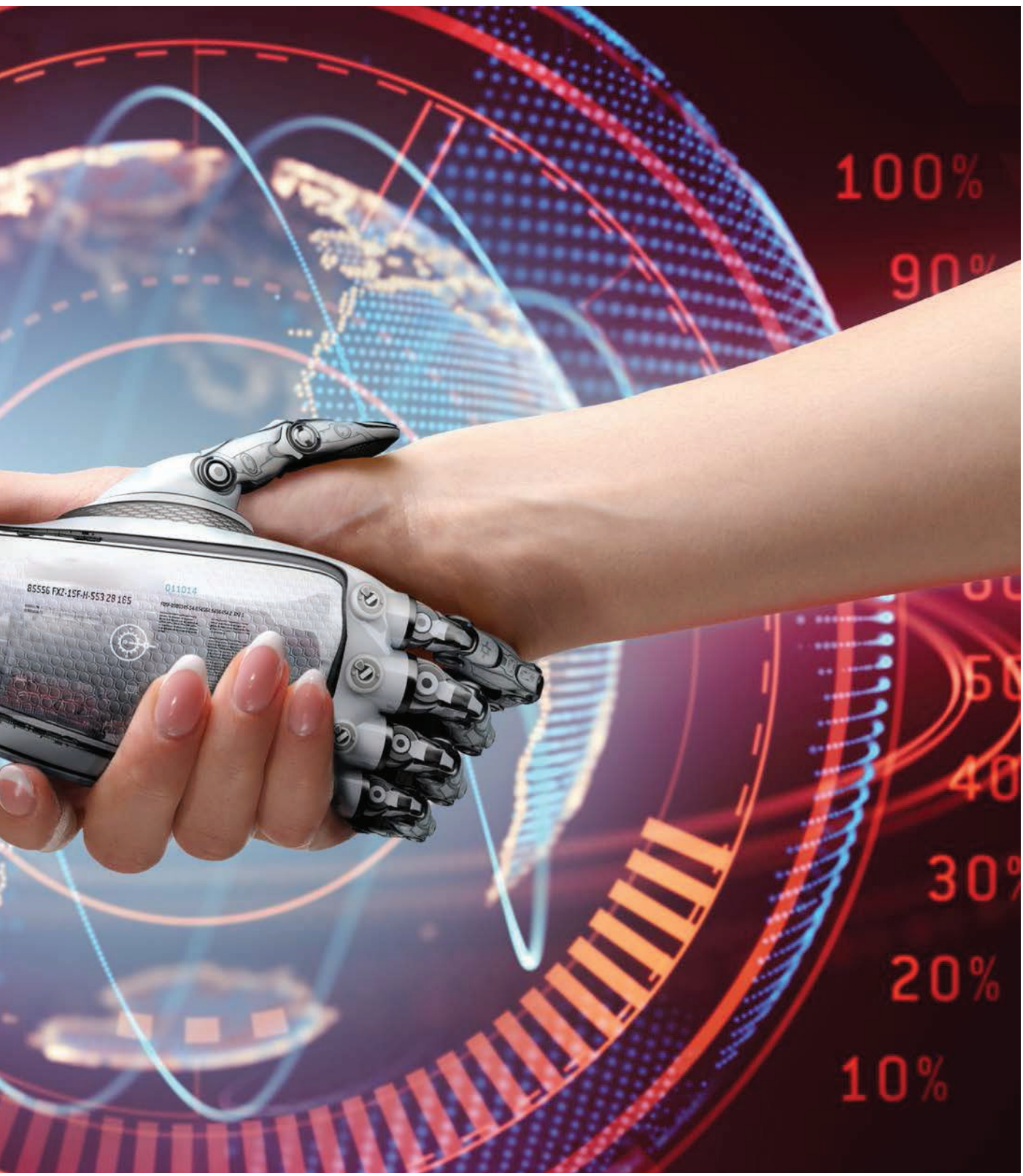
When it seemed that analog systems would be completely replaced by the IP systems, a new solution appeared that enabled high resolution imaging in the analog CCTV systems (Analog High Definition CCTV). This eliminated main limitation which was low resolution and low detail recognition.

So far main DSP processors producers haven't reached an agreement for Analog High Definition CCTV products. Therefore it was not possible to establish one standard respected by all producers. Main producers of analog CCTV systems who offer Analog High Definition CCTV products, have made their own solutions, which are compatible only with their own products. This leads to incompatibility with devices from other producers. Only AHD technology is „open" and DSP processors are widely available for hardware producers, hence the devices can be compatible with each other. It is a big advantage for CCTV installers and end users, as it allows free selection of devices from different producers.

The AHD devices can be used for modernizing current analog installations. Building the IP systems is difficult and costly, mainly due to necessity of replacing the cable infrastructure, while in case of replacing standard



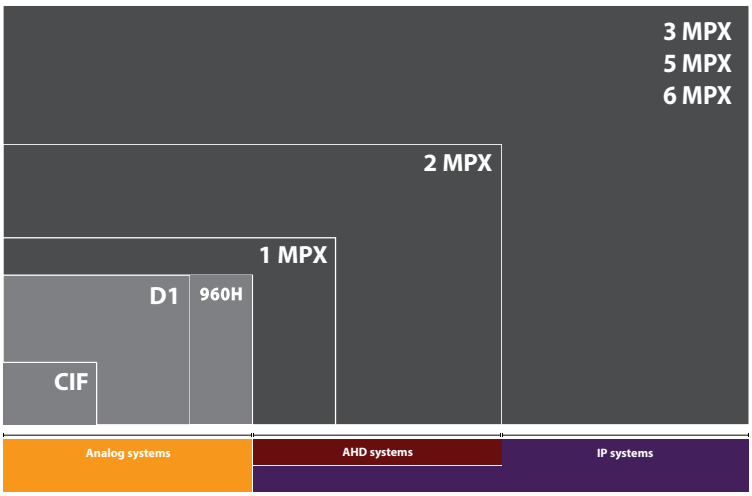


Fig. 1. Image resolutions of AHD CCTV

analog cameras to AHD cameras it is possible to use current coaxial and UTP cables.

Moreover, building the AHD systems is identical to building the analog systems of standard resolution and in case of modernization, no additional knowledge of IP configuration is required.

For transmitting the analog video signal, compatible with AHD standard, the same transmitters can be used as in the analog systems of standard resolution.

The cable infrastructure, which is the most time consuming issue, remains the same. This refers to coaxial cables, UTP cables and multi-pairs cables connected through passive converters. The possibility of using the multi-pairs cables relates only to the AHD systems as the competitive solutions failed to comply with transmitting signals through multi-pairs cables or they have limited range (up to 200 meters), which makes flawless modernization of many analog systems impossible.

For AHD systems the following transmission ranges are available:

- with RG59 cable: 300 m
- with RG6/11 cable: 500 m
- with category 5 UTP cable or higher (with passive converters): 300 m.

In case of transmitting the AHD signal with UTP cables a big advantage is the possibility of using the current converters.

In modernized surveillance systems both analog and AHD cameras can be used. During the modernization process it is required to replace the digital recorder with AHD compatible, while the cameras can be replaced successively. The signal inputs of AHD recorders will automatically adjust to the standard of connected video signals, which eliminates additional configuration needs.

In the IP systems image lags occur, which are caused by the need of processing and transmitting the digital data. This implies problems, especially in the security systems

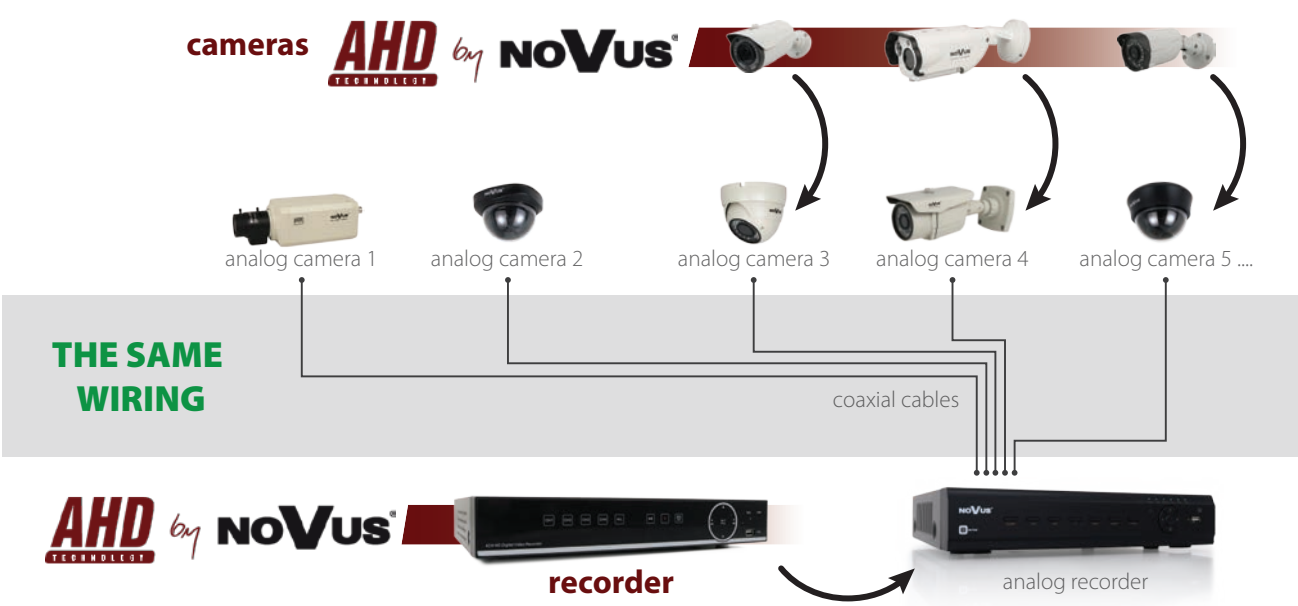


Fig. 2. Modernization of analog systems

Fig. 3. Comparison of standard resolution analog image and AHD 1,3 Mpx

with PTZ cameras, which require precise reaction to the operator's actions.

In AHD systems this type of lags do not appear and the image is always displayed in real time without lagging, because AHD cameras do not compress the video signal.

At many sites, despite the requirement of more detailed images, the proper color reproduction is very important (i.e. in security systems used in retail buildings). Thanks to the method of color coding the AHD systems are characterized by an excellent color reproduction of viewed objects.

The NOVUS family of AHD products is divided into two series in accordance to Megapixels value - 1,3 Mpx (also known as AHD 720p), and 2 Mpx (also known as AHD 1080p).

The AHD 1,3 Mpx series includes three bullet cameras and three dome cameras. All above models allow adjusting the settings through the OSD menu available in Polish language. The cameras are equipped with 3,6 mm fixed focal length or 2,8-12 mm varifocal lenses. All the cameras can work in AHD 720p and analog 960H modes. The angle of view can be adjusted in the range between 32 to 92 degrees (for AHD mode) or in the range of 30 to 88 degrees (in 960H mode). The sensitivity of AHD cameras is similar to analog cameras with CMOS sensors. Most of the models are equipped with standard or high power IR LEDs with range up to 40 meters. The IR LEDs work in the adaptive mode. They adjust the luminous intensity to the distance of illuminated object and its reflectance value which allows clear and not overexposed image of objects that are close to the camera. The cameras have IP66 degree of protection. The operating temperature (from -30°C to 40°C) allows outdoor installation. There are available commonly used features which improve the picture quality, such as - back light compensation (BLC), highlight compensation (HLC), wide dynamic range (WDR) and digital noise reduction (DNR). The privacy zones function is also available.

The video signals from AHD 1,3 Mpx can be recorded with NHDR-5000 series DVRs which are available in 4, 8 and 16 channels versions.

The AHD recorders have many features that are missing in the standard analog recorders. All monitor outputs with VGA or HDMI interfaces can be used simultaneously and allow display of full or reduced images on the screen divided into separate fields. The AHD DVRs are compatible with AHD cameras and standard analog cameras.

On the local monitor there are always displayed an uncompressed high definition images directly from the camera. In case of network transmission (through IE browser or NHDR-5000Viewer application) an auxiliary stream can be used which will be compressed accordingly to the settings made by the system administrator.

The remote access to the recorder through mobile devices with iOS and Android has been simplified.

Fig. 4. Color reproduction

Fig. 5. AHD 1,3 Mpx cameras

Fig. 6. AHD recorders 720p: NHDR-5004AHD, NHDR-5008AHD, NHDR-5016AHD

After establishing an internet connection the device automatically registers itself in the intermediary service. After installing the RXCAMLINK application the only actions that user has to perform are reading the QR code from the recorder or typing login and password. Thanks to this solution there is no need to access the network infrastructure and redirecting the IP ports or redeeming a fixed IP address.

Additionally, the system is able to archive the images from the cameras through remote access with Dropbox application. The archiving can be conducted periodically or triggered by motion/event detection function.

The intelligent function of finding changes in the defined content of the image is available in playback mode. It enables the operator to quickly detect lost or taken objects (i.e. in retail buildings).

Analog High Definition CCTV is one of the hottest topics of 2015 in the CCTV business. The simplicity of installation and most importantly the ease of modernization of hundreds of thousands of existing standard analog CCTV systems, are the reasons that allow to expect a dynamic growth of this segment. This growth, in short time, will lead to a complete replacement of currently used systems to high definition systems.

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