



# CCTV

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Video-monitoring system



## CCTV

### Description of the system

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**Video-monitoring system** is designed for installation in public transport vehicles and is used for viewing and registering video in- and outside the vehicle.

**Video-monitoring system** Video-monitoring system uses digital cameras IP Full HD, which allow to monitor: passenger's space by internal cameras, an area in front of and behind the vehicle with track, cameras and coupling cameras, passengers getting in/out the vehicle by mirror, cameras, pantographs and traction quality by pantograph, cameras.

Cameras can be additionally equipped with infrared illuminators (IR), which aim to improve quality of images recorded in poor lightning conditions or at night. Furthermore, external cameras with dedicated, heated cases with IP67 protection code, allow operation in harsh weather conditions.

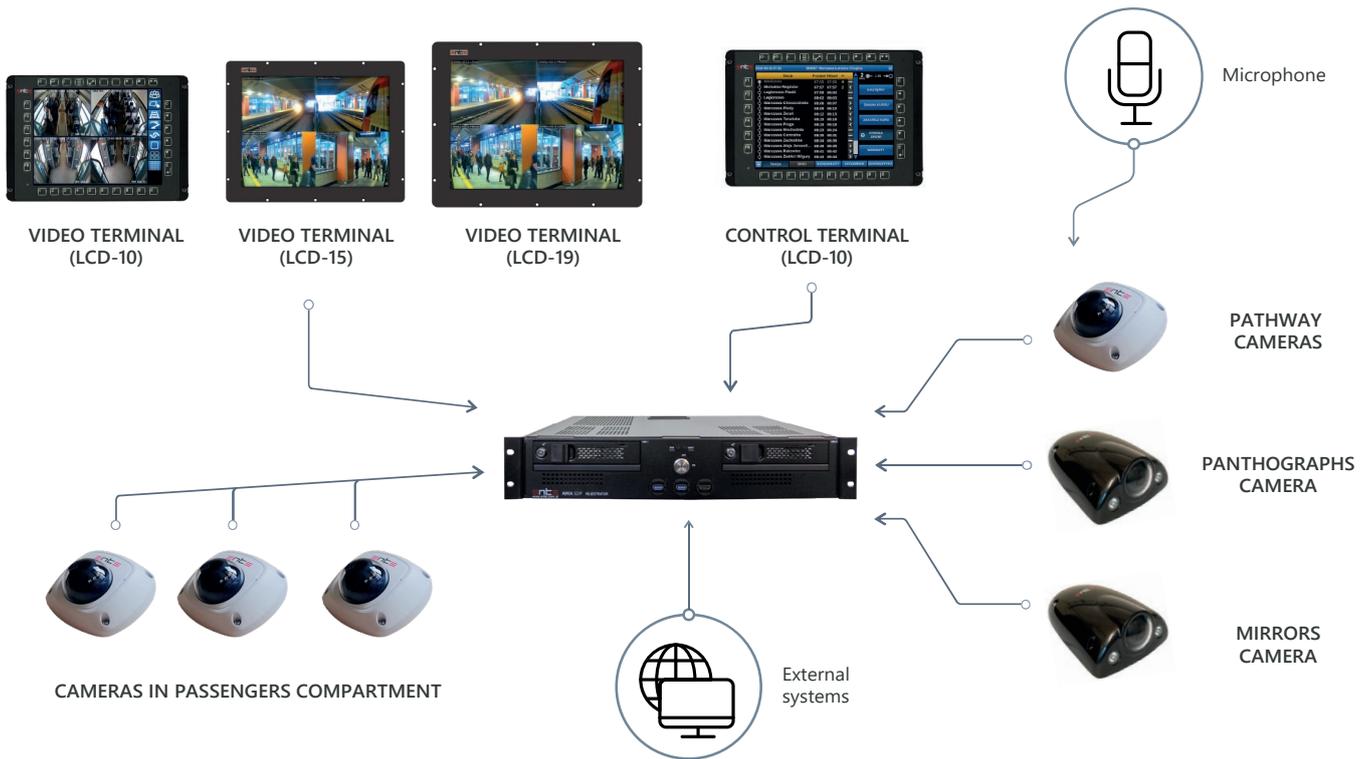
Images from the cameras can be viewed on dedicated LCD touchscreens or on control terminals, which are installed in engine driver's cabin and conductor's compartments.

Record of the images along with additional parameters (e.g. GPS position, name of the stop, train/line numer, alarm events) is realized by a video recorder.

The amount of recorded and stored data in the memory of the recorder depends on parameters of recorded images.

An access to stored data is possible by WWW due to dedicated embedded application installed in the recorder, as well as computer connected to the recorder by Ethernet or by removable disks and a dedicated docking station.

## System construction



## Functionality

### Current preview

- ✓ Live preview from cameras
- ✓ Division of camera images on one control or video terminal

### Browsing history

- ✓ Selecting a map or a camera in the elements of the grid which present historical material
- ✓ Searching records based on selected parameters:
  - train/line number
  - name of the station
  - date and time
  - information about a recorder operating time
  - recorded alarms

### Events

- ✓ Recording events with time after and before the event took place and automatic protection recordings
- ✓ Browsing events by selecting the camera that recorded the event

### Determining recorded material

- ✓ Determining material through selection of time intervals and selecting cameras from which the material is to be secured

### AWIA Flash®

- ✓ Detection of flares at the junction of the pantograph and the overhead line with simultaneous height detection of the overhead contact line
- ✓ Usage of existing hardware platform **AWIA SDIP®**
- ✓ Innovative software using proprietary algorithms based on neuronal networks

## Technical parameters

### Recorder RW01

<b>Processor</b>	Intel Celeron, Intel i7
<b>Memory</b>	DDR3 SO-DIMM x 2 up to 16 GB
<b>Resolution</b>	do 1920 x 1080
<b>Watchdog</b>	Yes
<b>Recording with compression</b>	H.264
<b>Nominal supply voltage</b>	+ 24 V DC
<b>Video outputs</b>	1xVGA/DVI/HDMI resolution up to 1920 x 1200
<b>Audio</b>	1 x wyjście i 1 x input for the microphone
<b>Pull-out disc pockets</b>	4x 2,5" lub 2x 3,5"
<b>Disc support</b>	2+2x 2,5" lub 2+2x 3,5"
<b>Raw discs capacity</b>	up to 48TB
<b>Interfaces</b>	1 x RS232 lub 422/485, 1 x USB 2.0, 1 x USB 3.0, 1 x ETH 100Mb M12 D-coded lub 1Gb M12 X-Coded
<b>Operating temperature</b>	-40° ~ +70°C
<b>Cooling</b>	passive
<b>Certificates</b>	CE, EMark Compliance, EN50155, EN 50121-3-2, EN 45545-2+A1

	Terminal LCD-10	Terminal LCD-15	Terminal LCD-19
<b>Screen diagonal</b>	270 mm (10,4")	381 mm (15")	482,6 mm (19")
<b>Image resolution</b>	1024 x 768	1024 x 768 (XGA)	1280 x 1024
<b>Brightness</b>	500 cd/m <sup>2</sup>	1000 cd/m <sup>2</sup>	1000 cd/m <sup>2</sup>
<b>Touchscreen</b>	Yes	Yes	Additional option
<b>Contrast</b>	1400:1	2500:1	1000:1
<b>Number of colors</b>	16,2M	16.7 M	16.7 M
<b>Operated interfaces</b>	1xUSB, 1xHDMI, 1xETH 1xMVB/ RS485/232, 1xRS485/232, 1xCAN, 1xAudio/LAN2/CAN2/ RS485/232	USB Host: USB 2.0 Compatible Ethernet: 10/100	1xUSB, 1xETH, 1xHDMI
<b>Internal memory</b>	RAM DDR3 1 GB	RAM DDR3 1 GB	RAM DDR 2 GB
<b>Flash memory</b>	8GB expandable	8GB expandable	8GB expandable
<b>Light intensity sensor</b>	Yes	Yes	Yes
<b>Nominal supply voltage</b>	+24 V DC	+24 V DC	+24 V DC
<b>Maximal power consumed by the device</b>	15 W	57 W	70 W
<b>View angle</b>	178°(H), 178°(V)	176°(H), 176°(V)	170°(H), 160°(V)
<b>Dimensions width/height/ depth</b>	310 x 214 x 83,5 mm	373,4 x 297,3 x 61 (64)	363 x 438 x 64,5
<b>Operating temperature range</b>	-40°C ÷ +60°C	-35°C - + 60°C	-35°C - + 60°C



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### ■ Technical parameters

	Internal camera KW01	External camera KZ01, Pantograph camera KP01
<i>Sensitivity</i>	0.01Lux@(F1.2, AGC ON), 0 Lux z IR	0.01Lux@(F1.2, AGC ON) 0 Lux z IR
<i>Image sensor</i>	1/2,7" progressive CMOS	1/ 2,7" progressive CMOS
<i>Focal length</i>	2.8mm	2,8 mm / 4 mm
<i>Day/Night</i>	Yes	Yes
<i>WDR (Wide Dynamic Range)</i>	Yes, 120dB	Yes
<i>Resolution</i>	1920 x 1080	1920 x 1080
<i>Power supply</i>	PoE (802.3af) lub M12 24V DC Molex	PoE 802.3af (M12) / 12 V DC lub M12 24V DC Molex
<i>Maximal power</i>	5W	8,8 W
<i>Ingress protection</i>	IP66	IP68
<i>Impact resistance</i>	Vandal-proof IK8	Vandal-proof IK10
<i>Operating temperature</i>	-30°C ~ 60°C	40°C ~ 70°C
<i>Humidity</i>	10% ~ 95% without condensation	10 % ~ 95% without condensation
<i>Image format</i>	Stream 1 (H265/H264) Stream 2 (H265/H264/MJPEG) Stream 3 (H265/H264)	Stream 1 (H265/H264) Stream 2 (H265/H264/MJPEG) Stream 3 (H265/H264)
<i>Heating</i>	No	Yes; PoE
<i>Certificates, compliance with standards</i>	EN 50155, EN 50121-3-2, IK8, PN-EN 45545-2+A1	EN 50155, EN 50121-3-2, IK10, EN 45545-2+A1

