



# LOGIPIX

[www.logipix.com](http://www.logipix.com)  
[logipix@smp.hu](mailto:logipix@smp.hu)



## CASE STUDY

The Borisov Arena in Belarus



## The LOGIPIX Video Surveillance System for Stadiums

### Case Study: The Borisov Arena in Belarus

#### Background

Football matches are one of the most crowded community events in the world. With thousands of people gathered together in one place a lot can go wrong. From operational issues, to medical emergencies, vandalism, theft, and fan disturbances, stadiums have the potential to become extremely high risk environments. With the new arena being built in Belarus, finding the right security system was key for organisers in order to provide a safe and enjoyable experience for everyone.

#### Requirement

The FK BATE Borisov Arena is one of the most important stadiums in Belarus. Having been recently opened, it can seat up to 13,126 people. We were asked to provide the latest security technology; a complex but yet user-friendly system that would effectively and efficiently monitor all areas of the stadium in high resolution allowing face recognition.

#### Solution

Forty individually installed 15MP LOGIPIX cameras cover the entire stadium providing 250 pixels per meter resolution. For the project, four LOGIPIX LNVRs were used to record and store the security footage. The Control Center displays the transmitted video stream and by using the computers' GPU through an OpenGL it can combine the images of the cameras to create panoramic views. In the Borisov Arena four panoramic images have been stitched from the camera pictures. Every group contains ten cameras, therefore the resolution of each panoramic image is greater than 135 megapixels.

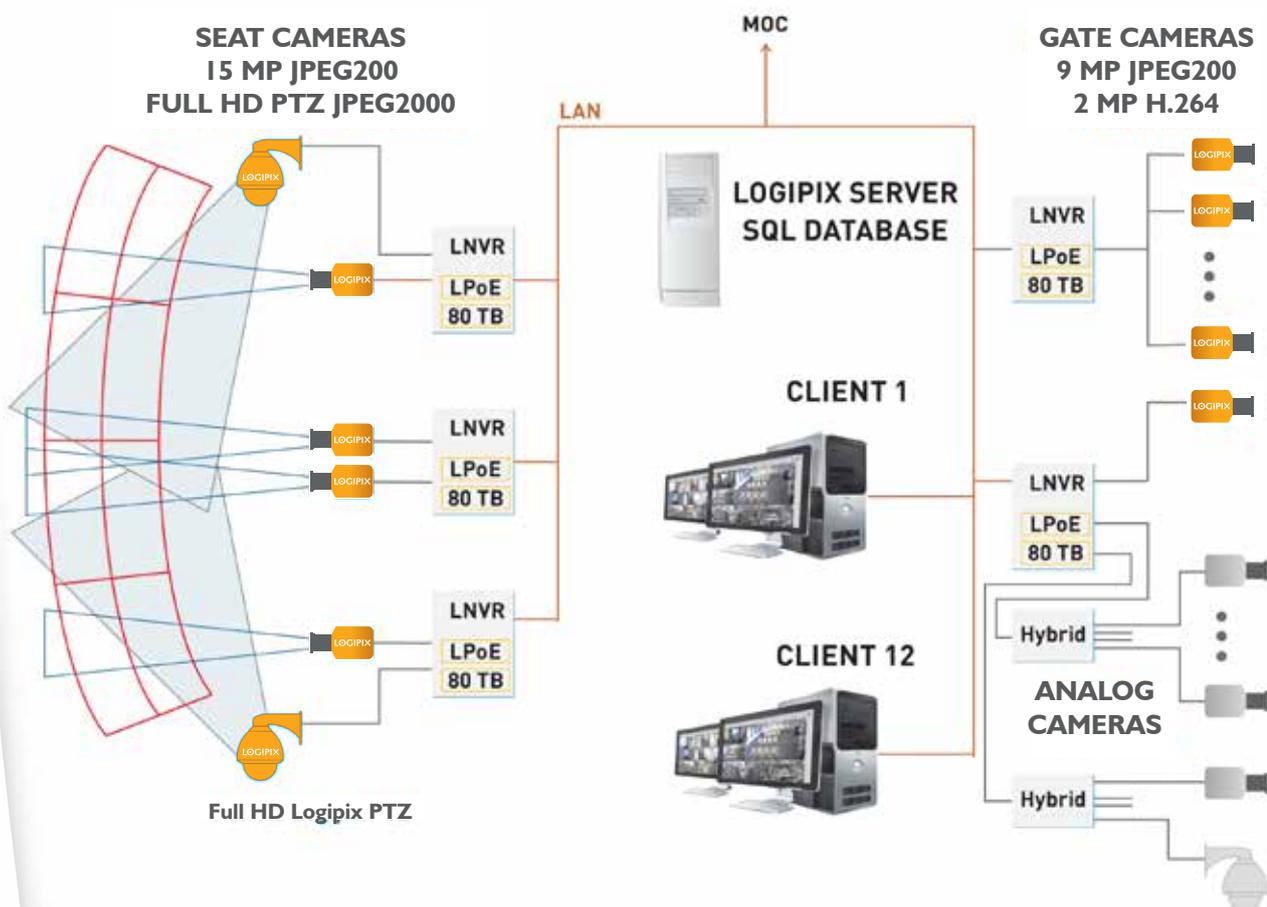


By using the JPEG2000 standard for image compression and by making use of the embedded multi-stream, we developed the LogiZoom; a hardware side zoom function that can significantly increase the efficiency of the system. Whilst the MultiZoom function allows for several high resolution zoomed areas to be observed on a single stitched image, in both live and archived video streams.

## Benefits

In the Borisov Arena, the LOGIPIX system provides the best end-to-end solution as it can efficiently monitor every critical area of the building. It helps to create safer environments in sport stadiums thanks to the high image quality and the clarity therein provided. Instead of several hundred analogue cameras, the LOGIPIX Video Surveillance System uses several multi-megapixel cameras, which helps to significantly reduce the cost of the installation and maintenance, and ensures that we can provide a flexible, individually tailored service.

## Stadium Video System





LOGIPIX FULL HD PTZ cameras are integrated into a LOGIPIX multi-megapixel panoramic video system. Together they form a complex surveillance system that makes use of the advantages of the HD PTZ and the multi-megapixel camera system. PTZ cameras can be controlled interactively by using the Management Software by selecting an exact area on the panoramic image. The suitable PTZ camera then turns to the desired location and zooms in. These images can provide valuable information not only for the stadiums security teams but also for the relevant authorities.

The Control Centre is capable of managing an unlimited number of multi-megapixel, HD or analogue cameras thereby not limiting the client. The images are stitched together into panoramic images for ease of use. It is thanks to the high-quality image processors that the system can cover large areas and provide face recognition. Reliable storage and seamless search back functions ensure that video evidence of incidents are quickly accessible whilst still conforming to local laws. Fewer cameras, by having their power supplied by the built-in LPoE routers, help to significantly reduce the installation and maintenance costs. The JPEG2000 compression standard also improves the efficiency of the system as it means that high resolution images can be sent over a low bandwidth.

## For a Safer Football Match Experience

Although a complex system, it has been designed to be extremely user friendly which ensures a quick training time for the security team. Once trained, they are able to monitor the entire interior and exterior of the stadium with ease. The security team manage two workstations each, and if an incident occurs at the seats, operators monitor any potential episodes, and can retrieve high resolution (1000 pixel/meter) optically zoomed images from special zoom windows. As they can act quickly, it means that any necessary actions can be taken without delay in order to prevent further crowd outbursts, serious injuries and/or significant damage in the stadium.

Spectators know that the new security surveillance system can identify them with unmatched accuracy. Using the LOGIPIX System at this stadium has ensured that vandalism and critical incidents have been kept at bay, ensuring a safe and welcoming stadium experience for everyone.



## REFERENCES

### Stadium Video Surveillance

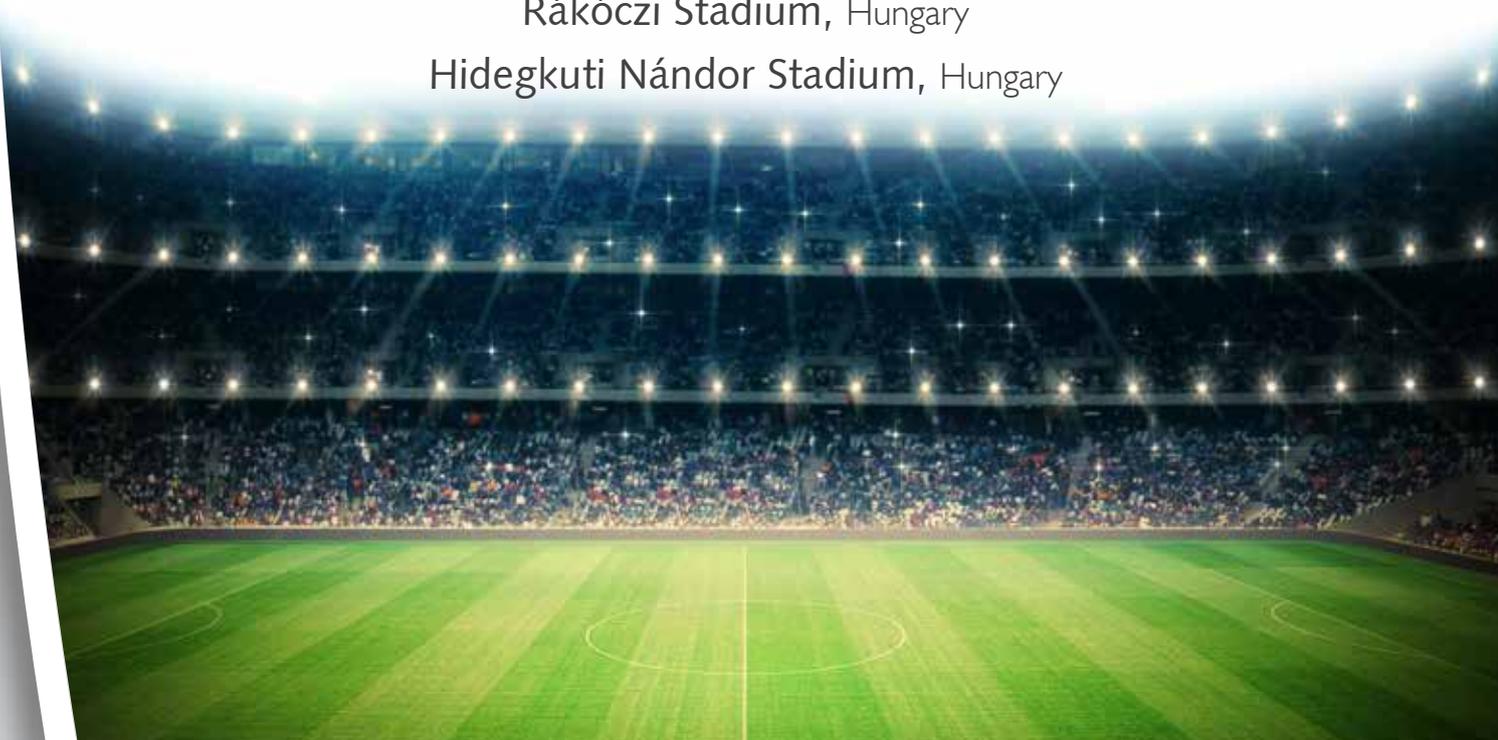
Bozsik Stadium, Hungary  
Haladás Stadium, Hungary  
Szusza Ferenc Stadium, Hungary  
DVTK Stadium, Hungary  
Széktói Stadium, Hungary  
Győri ETO Stadium, Hungary  
Pancho Arena, Hungary

### Borisov Stadium - FC BATE Barysaw, Belarus

Bath Rugby Stadium, UK  
Olympic Stadium, Cairo  
Albert Flórián Stadium, Hungary  
PMFC Stadium, Hungary  
Fehérvári úti Stadium, Hungary  
ZTE Arena, Hungary

### Currently under installation

Perutz Stadium, Hungary  
Rákóczi Stadium, Hungary  
Hidegkuti Nándor Stadium, Hungary





Products are distributed by:

**SMP Kft.**  
1139 Fiastyúk utca 71. Hungary  
[logipix@smp.hu](mailto:logipix@smp.hu)