



THE RAĆLAWICE PANORAMA :: WROCLAW :: POLSKA

The Raclawice Panorama is a branch of the Polish National Museum in Wrocław, which houses the only cycloramic painting in Poland (and one of few in the world). "The Battle of Raclawice" was created on the occasion of the 100 year anniversary of the Kościuszko Uprising and was meant to be the main attraction of the General National Exhibition in Lviv. The famous Lviv painter Jan Styka was appointed as the project leader, and he invited the outstanding military artist Wojciech Kossak to help with the masterpiece. A team under their leadership worked for 9 months to create the unique painting. The work of art is 15 m high and 114 m long and in the shape of a rotational hyperboloid. It has been placed in a rotunda that was specially built to house it. Thanks to special means used on the panorama, it was possible to achieve the illusion of actually participating in the viewed battle scene.

The stormy fate of the painting after World War II was settled in 1980, when it was decided that a rotunda would be built for it in Wrocław. In 1985, the construction of the museum building designed by Ewa and Marek Dziekoński was completed and "The Battle of Raclawice" was once again open to the public. In 2015, the authorities of the Polish National Museum in Wrocław decided to renovate the piece. Our task was to replace the exposition lighting. Completing this task proved to be a real challenge.





➤ THE SITUATION

The cylindrical building which was opened to the visiting public in 1985 required repairs from the very beginning. Since then, the outside of the rotunda was renovated step by step to repair the cracked pillars and tauten the canvas. Our job was to replace the entire outdated exposition lighting system. Until then, the Panorama was illuminated both by daylight and artificial light. The latter was emitted by fluorescent lamps, which significantly increased the operating costs in the building. The modernization consisted of replacing the existing luminaires with modern LED lighting with an automatic control system.





➤ THE CHALLENGE

Lighting museum exhibits – especially paintings – is extremely demanding. It's important to select the appropriate parameters for the LED light sources and meet very high standards. When paintings are exposed to the wrong lighting for prolonged periods of time, the color of the paint can change, paint layers can become brittle and crack, and sometimes even the canvas fibers can become damaged. In extreme cases, the wrong lighting can result in the complete destruction of the art work. Especially dangerous types of light includes infrared (IR) and ultraviolet (UV) radiation. The light sources used must pass extremely strict testing. The artificial light should resemble natural light as closely as possible, so as to fully showcase the beauty of the work. An additional difficulty while lighting the Raclawice Panorama is its size and displaying method. The 114 m long and

15 m high canvas is placed within a rotunda. The painting has the shape of a rotational hyperboloid and creates a coherent composition with the staffage positioned in the foreground. A crucial role is played by the light and shadows, which intensify the three-dimensional character of the piece. We had to carefully examine the way in which light helps to create this illusion.

The Raclawice Panorama is extremely popular with the public. It is visited by nearly 300 000 people each year. More than 1000 tourists come to see it every day. That is why all the repair work to date had been performed without closing the exhibit. Unfortunately, the installation of new lighting fixtures could not be done in the presence of visitors. The investor agreed to close the exhibit, but the deadline was very short. All these requirements made completing this project a very complicated endeavor.



> THE PROJECT

The Panorama had previously been illuminated with both natural and artificial light. After the modernization, this was still the case. The old conventional fluorescent lighting was replaced with modern luminaires with LED light sources. We installed over 600 meters of LEDEX TOP luminaires with a computer control system in the facility. Despite the extremely short delivery terms, we were able to finish the modernization in the required time.

The luminaires are characterized by their outstanding light quality. They have a color rendering index of over 95, the same goes for the R9 partial color rendering index. This means that the light is very close to ideally replicating natural sunlight. The LEDEX TOP luminaires have all the certificates required by the European norms, backed up by appropriate testing. They have also been tested for photobiological safety, and in the assessed radiation ranges, they have been classified in the lowest category of photobiological risk.

In an effort to make it easier to use that many luminaires, an extensive, adaptive control system was installed. It lets the user smoothly adjust the lighting intensity as needed, depending on the natural lighting conditions outside. The luminaires can be grouped

within the system and selected pre-programmed light scenes can be played back. The installed control system has significantly increased the comfort when handling visitor viewing sessions, and has additionally reduced energy demand by more than 80% compared to the previous lighting solution.

The energy consumption of the applied system is 50% lower in itself, while ensuring better lighting parameters. Further savings have been achieved thanks to the lightweight construction of the LEDEX TOP luminaires. Their width has been reduced threefold, which means that the area obstructing daylight is two times smaller than before. In addition, the lower weight of the entire installation reduces the load on the supporting structure by more than three times. The linear connection of the luminaires makes them easier to install and will also make subsequent maintenance require less effort. As a result, we've succeeded in reducing operating costs by more than 80%.

The very short lead time, specific quality requirements and the prestigious investment location made this one of the most difficult projects we have ever participated in. We are very pleased that the final result has met the investor's expectations.

Despite the very unusual task, in which the user's requirements regarding the quality of light exceeded the generally accepted standards, ES-SYSTEM handled the project exceptionally well by offering a solution that far surpasses the quality of the previous lighting, both in terms of Ra color rendering and energy savings by 80%, as well as the reliability and durability of this solution.

Janusz Wieland
Technical Manager



Color rendering index

CRI > 95

Partial color rendering index

R9 > 95

Energy savings of more than

80%

Lowest photobiological risk category



The high quality of the services offered by ES-SYSTEM resulted from a careful analysis of the Investor's needs and from competent and reliable solutions to lighting problems emerging during the investment cycle. The extremely sensitive and flexible responses to ongoing user suggestions is also worth emphasizing. ES-SYSTEM confirmed the high quality and reliability of its products.

Romuald Nowak
 Director of the Branch of
 the Polish National Museum -
 The Raclawice Panorama



> PROJECT SUMMARY

Project name:	THE RACLAWICE PANORAMA A branch of the Polish National Museum in Wroclaw
Client's business sector:	arts and culture
Location:	Wroclaw, Poland
Project starting date:	March 2015
Project completion date:	December 2015
Product:	LEDEX TOP
Product features:	CRI > 95, R9 > 95, 5000 K, savings of up to 80%
Architect:	Ewa and Marek Dziekoński - design of the rotunda, Remigiusz Smolik - renovation design
Lighting designer:	Artur Polski

