

WITH LIGHT BARRIERS ON A FAST-PACED SLIDE

HIGH-PERFORMANCE SYSTEMS ENSURE GREATER SAFETY



Due to their special technological properties, high-performance light barriers can be used in a variety of applications, e.g. for safeguarding a water slide in a leisure pool.
(All images: ipf electronic gmbh)

As in many leisure pools, a water slide is one of the main attractions at the Siegtalbad in Wissen. Since summer 2021, high-performance light barriers from ipf electronic have ensured safe swimming fun there.

The Siegtalbad was built in 1966 and extended by an outdoor pool two years later. About 12 years ago, during an extensive modernization under the leadership of the Stadtwerke Wissen as the operator of the pool, a sauna and gastronomy area, a heated four-season pool in the outdoor area and a 60-meter-long tube slide were added, among other things.

ACCESS CONTROL VIA TRAFFIC LIGHTS

To prevent collisions between bathers inside the slide, there are light barriers both at the entrance to the slide and at the end of the tube, which are linked to a traffic light in the indoor pool via a self-sufficient control system. "As an access control system, this safety system was part of the water slide's scope of delivery at the time. Over the years, however, it caused increasing problems due to aging and wear, among other things," says Thomas Munker, head of the electrical department at Stadtwerke Wissen.

PROVEN SYSTEM SOLUTION DOES CONVINC

Since malfunctions occurred time and again, the municipal utility decided to replace the light barriers in 2020. Thomas Munker remembers, "At the time we were looking for a new solution, Rainer Koch, application specialist from ipf electronic, visited us and presented a high-performance light barriers for safeguarding the water slide." The suggestion did not come out of the blue, because after all, such systems from the sensor specialist from Altena are already successfully in operation in some leisure pools. After examining further offers from other suppliers, including a manufacturer of radar sensors, the municipal utility finally chose the solution from ipf electronic, as Thomas Munker reports: "A test run completely convinced us. In addition, it was important for us to work with a regional partner with regard to spare parts, services and possible assistance during installation."

HIGH RESERVES INSTEAD OF RANGE

High-performance light barriers are disposable systems consisting of a transmitter, receiver and amplifier, with ipf electronic's wide-ranging selection allowing around 5,400 possible combinations. Already ex works, the amplifiers offer various basic functions, including a measuring operating mode, manual power setting and automatic power control, which simplify the installation and commissioning of the systems.

With extremely short-wave infrared light (wavelength 880nm), which has excellent penetration properties, and high transmission power, high-performance light barriers achieve ranges of up to 70 meters. This creates enormous power reserves at much shorter distances, which are mostly used for highly efficient contamination compensation in industrial areas with particularly harsh ambient conditions. Nevertheless, in view of their special properties, high-performance light barriers are also suitable for detecting objects located inside non-metallic enclosures, such as people in a tube chute made of glass-fiber-reinforced plastic.

SAFETY IN A TRIPLE PACK

In this specific case, the solution recommended by ipf electronic consisted of an **OS126101** transmitter, an **OE126001** receiver, and an **OV620810** single-channel amplifier with switching and analog outputs. While a light barrier was provided for the chute entrance, two systems were installed at the end of the tube, with the transmitter and receiver mounted alternately, as it were, in order to exclude mutual interference of a transmitter or receiver pair on one side of the chute wall. According to Martin Barth, foreman in the electrical workshop of Stadtwerke Wissen, the installation proved to be unproblematic because, among other things, the brackets of the old systems could be used for this purpose.

SIMPLE COMMISSIONING

The amplifiers of the high-performance light barriers are housed in a separate control cabinet and connected to a specially installed PLC, which uses the switching signals to control the traffic lights at the entrance to the chute. In addition, the PLC also controls the water treatment and the circulation pumps of the filter pools, among other things.

To commission the light barriers, Martin Barth chose the automatic operating mode and emphasizes, "It worked right away without any further interventions or readjustments." In the automatic operating mode, a high-performance light barrier independently determines the optimum transmission power. After switching on the light barrier, the amplifier first uses the maximum available transmitting power and then automatically reduces it until the receiver receives a signal for the switching output that can still be evaluated. If the previously determined signal strength of the light barrier at the receiver were now to decrease, e.g. due to creeping contamination of the optics of the transmitter or receiver, the amplifier readjusts the transmitting power accordingly. A person who interrupts one of the light barriers inside the slide is reliably detected, however, so that the switching output is set.

CLEAR SIGNALS FOR BATHERS

If a bather enters the slide and passes the upper light barriers, the traffic light switches to red, signaling to the next person that the slide is blocked. Once the bather in the tube has reached the lower light barriers, the traffic light changes to green after a time delay of four seconds and releases the slide again. Thomas Münker explains: "For safety reasons, both light barriers must switch at the end of the tube. By delaying until the traffic light signal switches, we also want to ensure that the bather has actually left this area and that the slide exit is clear."

If the light barriers at the end of the slide do not switch, the traffic light signal remains red and the lifeguard receives a message via a malfunction light. Only after he has checked the slide exit and additionally acknowledged the malfunction by pressing a button is the slide released.

REGULAR CONTROL OF SIGNAL STRENGTH

As already mentioned, the **OV620810** single-channel amplifiers integrate, in addition to the switching output, an analog output with which the transmitter and receiver can be precisely aligned via a 0...10V signal. Since the output proportionally maps the received signal of the light barrier, it also provides measurement signals for evaluation on a PLC. "We do not use the analog output for signal processing, but regularly check the signal strength of the light barriers via this," says Martin Barth.

The high-performance light barriers from ipf electronic were installed in the Siegtalbad in the summer of 2021 and have been working without any problems since then, as Thomas Münker confirms: "We have had consistently positive feedback on this from the staff in the indoor pool so far. There have been neither malfunctions nor failures."



The approximately 60-meter-long water slide is one of the attractions at Siegtalbad Wissen. .



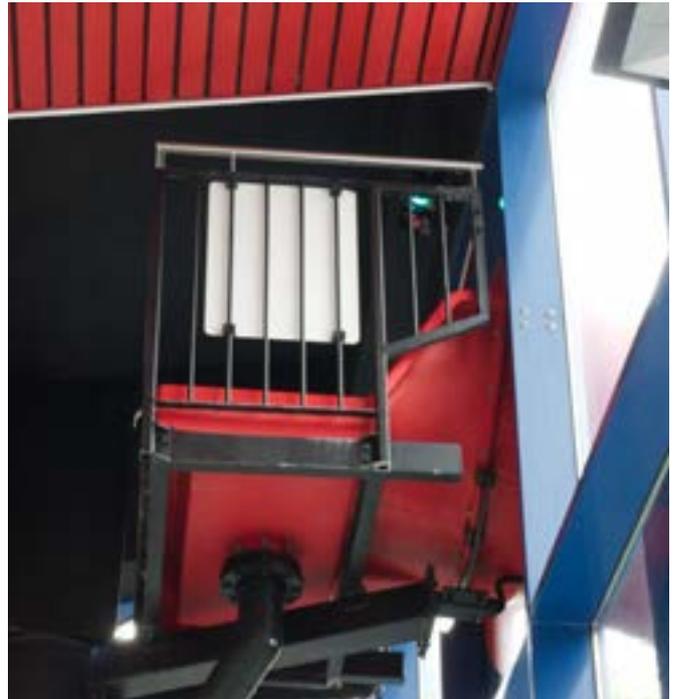
A high-performance light barriers is located underneath the cover (left) immediately behind the entrance to the slide.



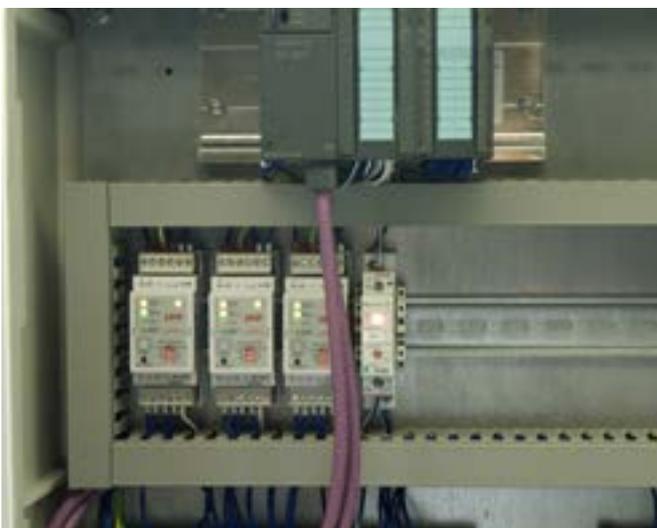
View under the cover at the end of the tube. Two systems were installed here, with transmitters (top) and receivers (bottom) of a light barrier mounted alternately on each side of the slide.



The exit of the slide opens into the indoor pool of the four-season pool. For safety reasons, the water slide is only released when both lower light barriers switch. The traffic light in the indoor pool then changes to green with a time delay of 4 seconds.



The traffic lights in the indoor pool are controlled by a PLC connected to the amplifiers of the high-performance light barriers.



The space-saving mounting of the single-channel amplifier **OV620810** with switching and analog output on a top-hat rail in the control cabinet below the PLC.