High-performance Outdoor PTZ Cameras Powers Precise Circuit Monitoring with KAIROS

Honda Mobilityland Corporation
Suzuka Circuit

Installation: March 2025
Location: Chubu Region, Japan

The Challenge

Implement a system that can precisely monitor a racing circuit and vehicles to ensure extra-safe and fair racing.

The Solution

Built a system of PTZ cameras designed for outdoor use that offer excellent durability, zoom performance and image quality, and then adopted KAIROS to manage multi-view displays for exceptionally safe and efficient race management.

"The AW-UR100 supports high-magnification and high-resolution zoom, making it possible to clearly identify debris as small as a coin on the track from 50 meters (approx. 55 yards) away."

Mr. Yoshitaka Ando
Assistant Supervisor
Race Management Department
Motorsports Division
Honda Mobilityland Corporation
Note: Job title at time of implementation

Background

Renewing the Race Monitoring System at Suzuka Circuit

At Suzuka Circuit, Japan's longest auto-race course for prestigious domestic and international races, a system of cameras installed along the circuit is used to monitor fast-changing race conditions and track status. The previous system introduced in 2009 had begun to show signs of aging. Coupled with recent advancements in vehicle performance, it became clear that more precise monitoring was needed. The system was upgraded with a new monitoring solution featuring AW-UR100 4K PTZ Cameras, which are designed for outdoor use and are known for their durability, powerful zoom and high-resolution imaging. The IT/IP platform KAIROS is used as the core system for management.

Why Panasonic's Solution?

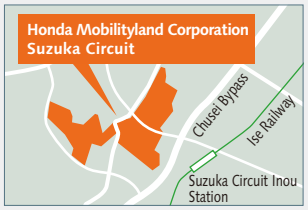
Highly Rated Zoom Performance and Image Quality

Mr. Yoshitaka Ando of Honda Mobilityland Corporation commented on the selection of the new system: "Zoom performance and image quality were essential to ensure that we could identify debris on the track, assess accidents, and detect rule violations during races. During our selection process, we conducted a test with an AW-UR100 camera on the main straight, which is about 800 meters (approx. 0.5 miles) long. This enabled us to confirm the camera's impressive 24x optical zoom and 10x digital zoom, as well as its outstanding image clarity, all of which were major factors in our decision to select the system."

Hallowed Ground for Japanese Motorsports

The Suzuka Circuit, operated by Honda Mobilityland Corporation, is a major entertainment facility centered on motorsports. The main course opened in 1962 as Japan's first full-scale track. Widely revered as the most hallowed location in motorsports, it is noted for hosting prestigious events such as the Formula 1 Japanese Grand Prix, SUPER GT, and the All Japan Road Race Championship.

- Location: 7992 Inou-cho, Suzuka City, Mie Prefecture
- URL: https://www.suzukacircuit.jp/



Racing Circuit Monitoring System

Benefits

High-performance Circuit Monitoring with Powerful 4K PTZ Cameras that Track Every Detail

The upgraded system includes 43 AW-UR100 cameras installed at key locations along the 5,807-meter (approx. 3.61 miles) circuit for real-time monitoring of the entire track surface and all vehicles during races.

Mr. Ando provided a detailed review of how impressed he was by the performance of the AW-UR100: "The image quality and zoom clarity that we observed during our evaluation were consistently outstanding. The AW-UR100 combines 24x optical and 10x digital zooms to deliver extremely high magnification. I was particularly impressed by the quality of the digital zoom. Usually, a digital zoom degrades image resolution and introduces noise, but the AW-UR100's 4K imagery is remarkably sharp.

If a vehicle goes off course during a race, it can sometimes bring grass or gravel back onto the track. This can pose serious hazards and even lead to spins or crashes. To prevent such incidents, people in the control room continuously monitor the track via cameras to watch for any debris that might obstruct the race. With the previous system, it was often difficult to determine exactly what was detected on the track. As a result, sometimes we had to stop a race temporarily to inspect the track in person.

The AW-UR100 supports high-magnification, high-resolution zoom, making it possible to clearly identify debris as small as a coin from 50 meters (approx. 55 yards) away. As a result, our control room personnel can now assess track conditions in real time using multi-view monitors, which has led to smoother operations and a significant reduction in race interruptions.

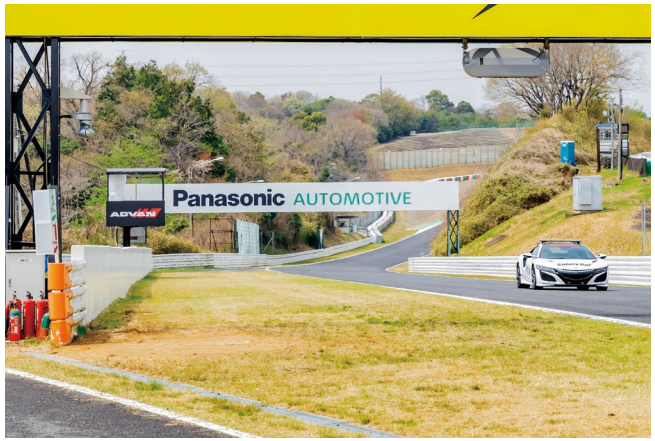
Also, the AW-UR100 captures bright, full-color video even in low-light environments, making it ideal for endurance races and events lasting into the evening. Camera feeds are also displayed on a large screen in front of the main grandstand. Thanks to the upgraded system's improved image quality, our spectators can enjoy a more immersive and compelling viewing experience."

Exceptional Durability for Stable Outdoor Performance

The AW-UR100's durability was also a key factor in its selection. "Suzuka Circuit is exposed to ocean breezes, so resistance to salty air was an important requirement," noted Mr. Ando. "We learned that the AW-UR100 has robust salt-resistant specifications and has a proven track record of deployment along highways, where regular maintenance is difficult—similar to the conditions on our track. We have great confidence in its reliability."

▲ AW-UR100 cameras on overhead signboards and course-side poles, featuring a sleek design that complements the course.

▲ AW-UR100 on a signboard above the home straight, offering triple image stabilization—optical, electronic, and pan/tilt—for stable footage even under challenging conditions.



▲ AW-UR100 on the course's west straight.

▲ IP65-rated AW-UR100 ensures reliable operation even in harsh weather, with a built-in lens wiper for rainy-day shooting.

▲ AW-UR100 on the west straight with both 24x optical and 10x digital zoom for capturing distant objects clearly.

▲ Clearly visible line colors and other details captured after sunset.

User-friendly Monitoring with KAIROS Multi-view Layouts

Video feeds from the 43 AW-UR100 cameras are transmitted to the East Control Room via optical fiber. Using an SDI-based system, rather than IP-based formats typically found in network cameras, helps to minimize transmission latency. The control room has ten screens for camera monitoring, six of which have multi-view layouts created with the Kairos Core 200 AT-KC200. The Canvas function of KAIROS is used to produce layouts in three modes—Race, Practice and Full-Screen—each of which is tailored to specific operational needs.

Commenting on the multi-view operability, Mr. Ando noted: "Before the upgrade, each camera was assigned to a dedicated monitor, which made it impossible to enlarge or reassign video feeds. Since the new system enables flexible multi-view monitoring, we requested layouts and video assignments suited to our particular operations. For example, one of the six multi-view monitors uses Race Mode to simultaneously display four corners where violations are likely to occur."

Advanced Control System for Precise Operation

A custom-designed switcher and the AW-RP150GJ Remote Camera Controller are used to control the AW-UR100 cameras, as well as adjust images and switch camera feeds to monitors.

The switcher is used to display multi-view layouts, switch seamlessly between cameras, and select video content for enlarged displays. Presets enable all 43 camera positions to be switched instantly with a single button, ensuring intuitive operation during fast-paced action.

The AW-RP150GJ controller is used for operations such as tracking moving vehicles and focusing on specific points of interest during races. It simplifies the adjustment of PTZ speed, shutter speed, white balance and other detailed settings. According to Mr. Ando, the user-friendly interface significantly enhances smooth operation during races.

Mr. Ando noted: "Since installing the system, we've used it for three races. Within the first month, we took advantage of the AW-RP150GJ's excellent adjustment capabilities to resolve issues in real time, leading to significantly improved operational accuracy and operator proficiency. By fine-tuning PTZ speed to match operator handling and vehicle speed, the system reliably responds to situations requiring precise operation, such as tracking moving vehicles, and enables accurate, real-time monitoring."

▲ In the East Control Room, camera feeds are monitored on ten screens, including six with multi-view displays.

▲ KAIROS is used to create multi-view displays in Race Mode on six monitors.

▲ AW-UR100 camera operated with a custom switcher and the AW-RP150GJ Remote Camera Controller.

▲ The AW-RP150GJ controller enables moving vehicles to be tracked smoothly.

▲ Control desk setup in East Control Room.

▲ Full-Screen Mode displays on six monitors.

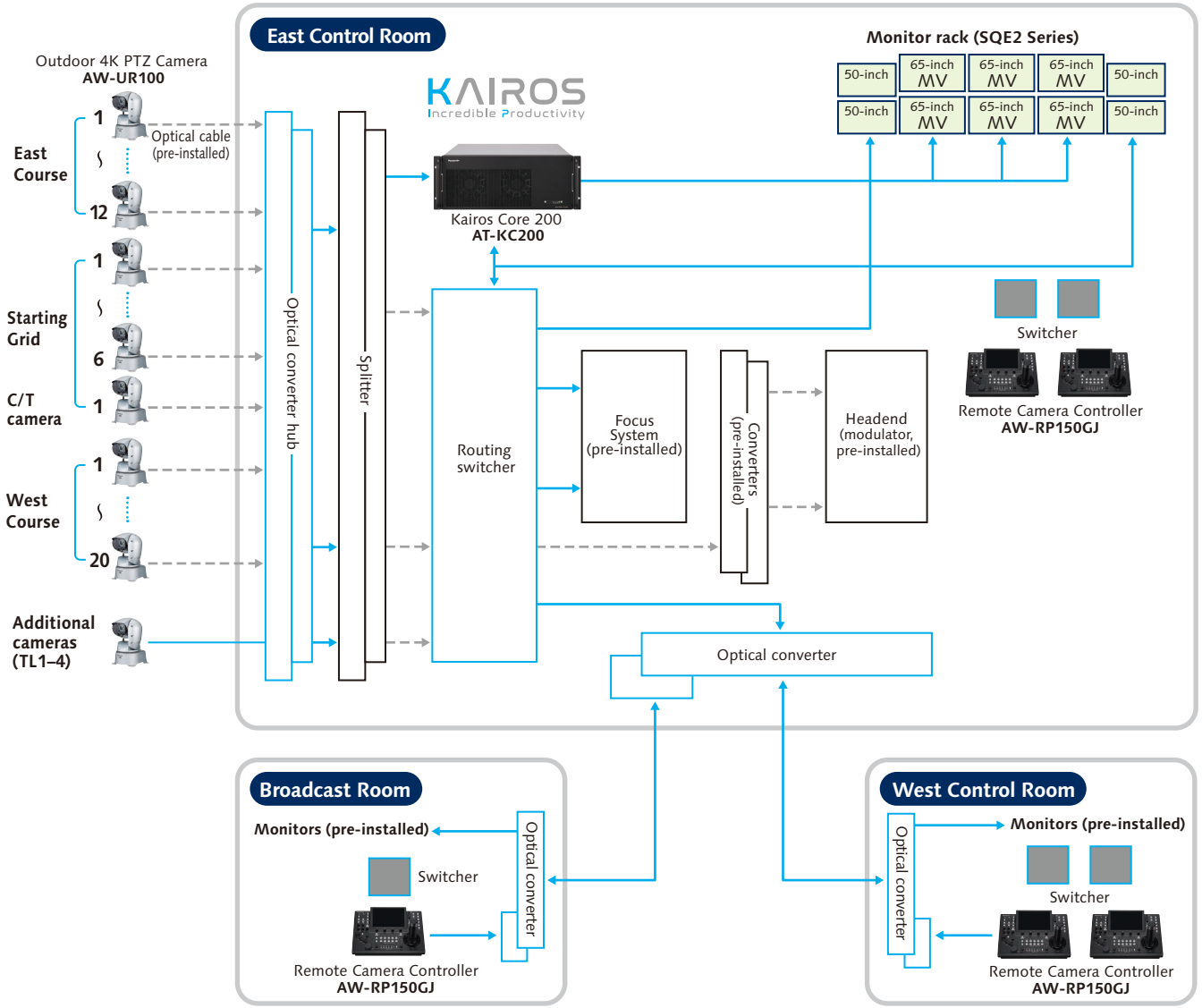
▲ Kairos Core 200 AT-KC200.

▲ Camera video feeds transmitted via optical fiber to East Control Room.

Entertainment

Racing Circuit Monitoring System

System Configuration

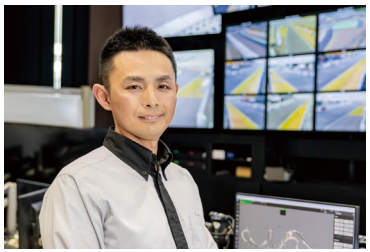


In the Customer's Own Words

Beyond Monitoring: Unlocking New Applications

"We received tremendous support from Panasonic's sales representatives and engineers throughout the entire process, from design to construction completion. We also received thorough training in operations, which enabled us to successfully manage major races within just one month after delivery. We are truly grateful.

While the system's primary purpose is circuit monitoring, the recent upgrade has greatly improved video quality as well. Moving forward, we hope to leverage the system in more ways than just monitoring. One idea is to offer a service that allows visitors to view camera footage directly from the Suzuka Circuit website. By publishing sequential feeds from all 43 cameras, we aim to let users check course conditions before arriving at the venue. Currently, the control room operates in HD resolution, but AW-UR100 cameras support 4K shooting. We are also exploring the possibility of streaming events in high quality using 4K feeds."



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Installed equipment

Outdoor 4K PTZ Camera	**AW-UR100**	×44
Remote Camera Controller	**AW-RP150GJ**	×5
Kairos Core 200 (Main Frame)	**AT-KC200**	×1
Kairos Creator (GUI Software)	**AT-SFC10**	×1

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https://pro-av.panasonic.net/en/

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