



Physical Security End-to-End Solution Provider

White Paper | Smart Dual Light

SMART DUAL LIGHT

A practical white paper for event-driven night surveillance, active deterrence, color evidence, and AI-enabled security operations

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Document purpose

This white paper explains the value of Smart Dual Light surveillance for professional security projects and positions ACTi dual-light cameras as part of an integrated video surveillance ecosystem. It is written for system integrators, consultants, security managers, facility managers, and procurement teams.

1. Executive Summary

Smart Dual Light surveillance combines invisible infrared illumination with visible white-light illumination under intelligent camera control. At night, the camera can use IR illumination for discreet monitoring, then activate white light when a meaningful event occurs so that the scene can be captured in color and the intruder may be deterred. ACTi describes dual-light cameras as devices that include both IR LED and white LED illuminators, while Smart Dual Light adds automatic control based on scene analysis and significant objects such as people or vehicles. [1]

For end users, the value is practical: improve night evidence, reduce dependence on always-on lighting, and create a stronger real-time deterrent. For system integrators and consultants, Smart Dual Light creates an upgrade path from conventional night surveillance to event-driven nighttime security with better evidence and clearer response workflows.

A well-designed Smart Dual Light system should not be evaluated only as a camera feature. It should be evaluated as an operational chain: monitor discreetly, detect relevant activity, illuminate visibly when needed, capture color evidence, trigger NVR/VMS/CMS events, and guide operators toward the next action.

Core message

Smart Dual Light is strongest when a site needs both low-disruption night monitoring and color evidence during meaningful incidents. It allows IR to handle routine nighttime observation while white LED is reserved for deterrence, verification, and evidence capture.

Key takeaways

- IR illumination supports low-visibility night monitoring without obvious visible light.
- White LED supports full-color capture in darkness and can also act as a visible deterrent.
- Smart control reduces unnecessary white-light usage by activating it only during selected events.
- AI analytics, people/vehicle detection, sound-triggered events, and VMS actions can convert lighting into a security workflow.
- Deployment quality matters: scene layout, lighting policy, privacy rules, mounting angle, event sensitivity, and operator SOPs all affect the result.

2. About ACTi Corporation

ACTi Corporation is the writer and publisher of this document. ACTi is a Taiwan-based international company founded in 2003 and serving customers in more than 100 countries. ACTi positions itself as a physical security end-to-end solution provider with a portfolio that includes IP cameras, analog cameras, network video recorders, hybrid DVR, VMS software, workstation applications, web clients, access control, central management, system health management, and third-party system integration. [2]

In video surveillance, ACTi provides cameras, recording platforms, standalone and software-based VMS options, and integration paths for real-time video verification. In access control, ACTi supports management of people and vehicle access through readers, door stations, and integration with video systems. In control center deployments, ACTi Central Management System is designed for multi-site monitoring, TV wall operation, and large project scalability. [2]

ACTi also emphasizes AI-enabled security. Its AI portfolio includes deep-learning cameras and analytics functions that support detection, tracking, counting, classification, recognition, and identification of people, faces, vehicles, license plates, and other object types. For Smart Dual Light surveillance, this broader ecosystem matters because lighting events become more useful when they can be detected, recorded, verified, searched, escalated, and integrated into the operator workflow. [2]

Why ACTi is relevant to Smart Dual Light projects

ACTi strength	Project relevance
End-to-end system scope	Dual-light cameras can be planned together with VMS, NVR, CMS, access control, alarms, intercoms, and third-party systems instead of being treated as isolated devices.
Security-industry experience	ACTi corporate materials state more than 20 years of security-industry experience and adoption across vertical markets. [2]
AI and metadata direction	Lighting behavior becomes more actionable when combined with people/vehicle analytics, event metadata, and central monitoring workflows.
Integrator-friendly portfolio	Multiple product types and form factors allow system integrators to match Smart Dual Light surveillance to different installation sites and budget levels.

3. What Smart Dual Light Means

Dual Light means that a camera has both IR LED and white LED illuminators. IR LED produces illumination that is invisible to the human eye but usable by the camera, typically resulting in monochrome night images. White LED produces visible-spectrum illumination so the camera can capture full-color images even in total darkness. [1]

Smart Dual Light adds intelligence to the lighting behavior. Instead of leaving white light on continuously, the camera can stay in IR mode during routine night monitoring and switch to white LED when a configured event occurs. ACTi describes this as automatic control where built-in AI analyzes the scene and activates white LED when a significant object, such as a person or vehicle, needs to be captured in color. Once the object is gone, the camera switches back to IR mode. [1]

This changes the role of camera lighting. Conventional night surveillance is often passive: the camera records with IR or relies on external light. Smart Dual Light is event-driven: the camera uses lighting as part of detection, deterrence, verification, and evidence capture.

Dual-light surveillance modes

Mode	How it works	Best fit
IR night mode	The camera uses invisible IR illumination and usually records monochrome video at night.	Discreet night monitoring, residential areas, low-disturbance sites, and routine observation.
White LED always-on mode	The camera keeps visible white light on so the scene can remain in color.	Sites where constant illumination is acceptable and color video is required throughout the night.
Smart Dual Light mode	The camera normally uses IR, then activates white LED upon selected events such as people detection or sound detection.	Intrusion deterrence, color evidence capture, restricted-area protection, and low-disruption night operations.

Practical interpretation

Smart Dual Light is not simply brighter night vision. It is a lighting policy: use invisible light for normal monitoring and visible light when the event deserves attention, color evidence, or deterrence.

4. Core Technical Concepts

Smart Dual Light decisions should be made from both a security perspective and an imaging-performance perspective. The following concepts help project teams compare products accurately and avoid under-designed deployments.

Concept	Practical meaning
IR LED illumination	Invisible infrared light supports nighttime imaging without making the scene visibly bright to people nearby. It is suitable for discreet monitoring and lower light pollution.
White LED illumination	Visible-spectrum light enables full-color capture in dark scenes and may also deter intruders because the lighting change is obvious. [1]
Smart lighting control	The camera selects IR or white LED automatically according to scene conditions and configured event logic, rather than relying only on manual settings.
AI object analysis	Built-in analytics can identify significant objects, such as people or vehicles, and trigger white light only when higher-value evidence is required. [1]
Color evidence	White LED allows the visible channel to capture clothing color, vehicle color, object color, and scene context that may be lost in monochrome IR mode.
Active deterrence	A sudden white-light activation can notify intruders that they have been detected, potentially reducing loitering, trespassing, theft, or vandalism.
Event-based operation	White LED can be configured to activate upon events such as people detection or sound detection, depending on camera capability and configuration. [1]
Scene and exposure tuning	The best result depends on mounting height, target distance, field of view, reflective surfaces, weather, LED range, exposure settings, and rule sensitivity.

Specification interpretation

A single specification rarely determines real-world performance. The value of Smart Dual Light depends on how lighting behavior matches the site objective. A camera with strong white LED output may still perform poorly if mounted at the wrong angle, aimed at reflective surfaces, or configured with overly sensitive event rules. Conversely, a modest lighting setup may perform well when the detection zone, field of view, and operator workflow are clearly designed.

Procurement warning

Do not compare Smart Dual Light cameras only by resolution or LED range. Confirm event logic, detection classes, night image quality, white-light behavior, VMS/NVR event integration, privacy requirements, and acceptance-test conditions.

5. High-Value Applications

ACTi identifies Smart Dual Light as useful where white LED is required and especially where users want to deter intruders or capture color evidence after an event. [1] These applications can be grouped into deterrence, evidence quality, and operational efficiency.

Application	Operational value	Typical locations
Perimeter intrusion deterrence	White LED activates when a person or vehicle enters a protected zone, creating a visible signal that the activity has been detected.	Factories, warehouses, logistics yards, utilities, construction sites, fenced perimeters, parking areas.
Color evidence at night	Operators and investigators can review color details that monochrome IR may not preserve, such as vehicle color, clothing color, carried objects, or direction of movement.	Entrances, loading docks, gates, parking lots, campuses, storefronts, public-area corridors.
After-hours facility protection	Event-triggered lighting helps distinguish routine low-risk monitoring from meaningful activity outside business hours.	Schools, offices, public buildings, warehouses, government facilities, retail sites.
Parking and vehicle areas	Visible lighting can support vehicle verification, loitering response, and theft deterrence without keeping the whole area constantly illuminated.	Parking lots, garages, driveways, fleet yards, logistics staging areas.
Remote-site monitoring	Smart lighting reduces the need for manual patrols by combining night detection, visible deterrence, and event notification.	Solar farms, substations, telecom sites, storage yards, remote utility sites.
Residential or low-disturbance areas	IR can remain active for normal monitoring while white light is limited to important events to reduce unnecessary light pollution.	Apartments, campuses, mixed-use facilities, perimeter walkways, community sites.

Value by stakeholder

Stakeholder	Main benefit
System integrator	Creates a higher-value night surveillance proposal that combines camera selection, analytics, lighting policy, VMS event handling, and customer SOPs.
Consultant	Provides a structured way to specify event-based lighting, evidence expectations, and acceptance criteria in tenders.
Security manager	Improves night response by combining deterrence, color evidence, and event-based monitoring.
Control room operator	Receives more meaningful alarms and clearer visual context when white light is triggered.
Facility or property manager	Reduces unnecessary lighting while keeping a deterrent response available during important events.
Procurement team	Can evaluate total solution value rather than purchasing only a standard night camera replacement.

6. System Architecture

From an NVR or VMS perspective, Smart Dual Light cameras can behave like standard IP surveillance cameras while also providing event-driven lighting behavior. The camera captures video, applies configured detection logic, activates white LED when appropriate, and sends video streams and events to the recording and management platforms.

Typical event-driven workflow

- 1 Monitor** - The camera observes the scene using IR illumination or available light during normal nighttime conditions.
- 2 Analyze** - Built-in analytics or configured triggers evaluate whether the scene contains a relevant object or event.
- 3 Illuminate** - White LED activates when the event meets the configured conditions.
- 4 Capture** - The camera records color video while the event is active, preserving clearer visual evidence.
- 5 Notify** - The camera sends events to the NVR/VMS/CMS, where operators can receive popups, maps, clips, alarms, or notifications.
- 6 Respond** - The organization follows SOPs such as guard dispatch, voice warning, access control action, or escalation.
- 7 Record** - Video, snapshots, event metadata, timestamps, and operator actions are retained for investigation and reporting.

Reference architecture

Layer	Role in Smart Dual Light surveillance
Field layer	Dual-light cameras, visible cameras, PTZ cameras, access control readers, alarms, intercoms, speakers, sensors, and lighting-related I/O devices.
Network layer	PoE switches, fiber/uplink infrastructure, VLAN segmentation, secure remote access, bandwidth planning, and power budget planning.
Recording layer	NVR/VMS receives video streams, event triggers, snapshots, and metadata; stores evidence for investigation.
Management layer	CMS/control center aggregates multi-site events, displays map or TV wall views, and supports centralized response.
Response layer	Operator SOPs, guard dispatch, deterrence actions, notifications, alarm outputs, access control integration, and reporting.

Integration principle

Smart Dual Light creates value when the lighting event is connected to a response workflow. A camera that turns on a light is useful; a camera that detects, illuminates, records, alerts, and guides action is a solution.

7. ACTi Product Portfolio Overview

ACTi Smart Dual Light-related offerings should be presented by product type and form factor instead of by specific part numbers. This keeps project documents more durable as product names, regional availability, and portfolio details evolve over time.

The relevant ACTi portfolio can be described as outdoor and indoor IP surveillance cameras that combine IR illumination, white LED illumination, day/night operation, low-light imaging, analytics capability, and integration with ACTi recording and management platforms. Exact capabilities vary by product type, firmware, and regional offering, so final specifications should always be confirmed from current ACTi datasheets and quotation documents.

Portfolio categories

Category	Where it fits
Fixed bullet cameras	Outdoor perimeter, entrances, loading docks, parking areas, warehouses, and other zones that need directional monitoring and visible-light deterrence.
Zoom bullet cameras	Sites that require adjustable field of view, longer-distance framing, or more flexible installation tuning.
Outdoor fixed turret cameras	Compact outdoor installations where appearance, flexible aiming, and night color evidence are important.
Outdoor fixed dome cameras	Public-facing or semi-public areas where tamper-resistant appearance and broader site acceptance are important.
Outdoor zoom dome cameras	Sites that require adjustable view coverage with a dome form factor.
Outdoor PTZ / speed dome cameras	Wide-area monitoring, patrol routes, and operator-controlled investigation where movable viewing and active night response are required.
Multi-sensor or panoramic cameras	Open areas where broader coverage is required and Smart Dual Light can support event-based color evidence.
Thermal and visible-light hybrid categories	Specialized sites where thermal detection and visible confirmation may be combined with dual-light visual evidence depending on product configuration.

Product type and use-case fit

Product type	Form factor / role	Use-case fit
Fixed bullet cameras	Directional outdoor monitoring	Perimeters, gates, loading docks, warehouse yards, and parking lanes.
Fixed turret cameras	Compact outdoor monitoring	Building entrances, small perimeters, walkways, campus areas, and property edges.
Fixed dome cameras	Protected public-facing monitoring	Schools, offices, retail, government buildings, and semi-public spaces.
Zoom cameras	Adjustable scene coverage	Sites where the final field of view must be tuned during installation or POC testing.
PTZ / speed dome cameras	Movable wide-area surveillance	Large outdoor sites, patrol-based monitoring, operator-controlled investigation, and high-value zones.
Multi-sensor cameras	Wider-area situational awareness	Open areas, intersections, parking lots, plaza-style locations, and broad perimeter views.

Product availability, detailed specifications, analytics support, accessories, and regional part numbers should be confirmed from the latest ACTi product pages, datasheets, firmware release notes, and quotation documents before formal project submission.

8. Deployment and Procurement Guidance

Smart Dual Light projects are most successful when site design begins with the event to be handled rather than a specific product name. A parking-lot deterrence project, a school after-hours monitoring project, and a warehouse loading-dock project may all use dual-light cameras, but their lighting policy, mounting height, detection zones, alarm thresholds, and acceptance criteria can be very different.

Design questions before selecting a camera

- What is the target event: person intrusion, vehicle intrusion, loitering, after-hours access, sound-triggered activity, or general night observation?
- Should white LED be always on, manually controlled, schedule-based, or activated only by events?
- Is the priority deterrence, color evidence, operator verification, or reduced light pollution?
- What target size must be captured, and at what maximum distance?
- What environmental conditions must be handled: darkness, rain, fog, dust, backlight, headlights, reflective surfaces, insects, vegetation movement, or seasonal change?
- What response should occur after white LED activation: VMS popup, siren, audio warning, guard dispatch, email, mobile notification, access control action, or emergency escalation?
- What privacy, neighborhood, workplace, or lighting-policy constraints apply to visible white light?

Procurement specification checklist

Procurement item	What to define
Detection objective	Specify what the system must detect and when white LED should activate.
Lighting policy	Define IR mode, white LED mode, event-based lighting, schedule, manual override, and maximum activation duration.
Image quality	Define required day/night image quality, color evidence needs, field of view, target distance, and exposure expectations.
Analytics and triggers	Confirm people/vehicle analytics, sound detection, motion rules, line crossing, intrusion zones, schedules, and sensitivity settings.
Integration	Confirm event transmission to ACTi NVR/CMS or third-party VMS, including event names, snapshots, metadata, and response actions.
Cybersecurity	Define account management, firmware update process, network segmentation, secure protocols, audit logs, and access control.
Environmental durability	Specify weather rating, vandal resistance where needed, operating temperature, mounting accessories, cabling, surge protection, and service access.
Acceptance testing	Define test target, distance, lighting mode, event trigger, alarm latency, false alarm tolerance, image evidence quality, and documentation.

9. Operational Best Practices

Smart Dual Light is an operational system, not only a camera option. The lighting behavior must be installed, configured, validated, monitored, and maintained in a way that matches the user's risk profile and site rules. The following practices help reduce false alarms, unnecessary light activation, and poor night evidence.

Configuration and alarm tuning

- Use separate rule profiles for different zones, such as gates, perimeter lines, parking spaces, loading docks, walkways, or restricted areas.
- Set white LED activation conditions based on real site testing rather than generic sensitivity values.
- Avoid aiming the camera directly at reflective signs, glass, wet floors, headlights, exhaust areas, dense vegetation, or constantly moving objects unless these are part of the intended monitoring area.
- Use schedule-based rules where lighting policy changes by time of day, work shift, or site operating status.
- Define the LED activation duration so that operators receive enough color evidence without creating unnecessary light disturbance.
- Use adjacent cameras or wider overview views when the dual-light camera is focused on a narrow zone.
- Document the alarm meaning and response action in the VMS/CMS operator SOP.

Maintenance and governance

Practice	Reason
Periodic verification	Test event rules and lighting behavior at defined intervals using approved test conditions and document results.
Lens and housing cleaning	Keep the field of view clear; dirt, water, spider webs, insects, obstruction, or incorrect housing can degrade night image quality.
LED behavior review	Confirm that IR and white LED behavior still matches the site policy after firmware updates or configuration changes.
Firmware control	Maintain firmware versions, release notes, update approvals, rollback plans, and cybersecurity review.
Operator training	Train operators to understand why white light was activated, how to verify the incident, and when to escalate.
Evidence review	Confirm that event clips, color video, snapshots, timestamps, and operator notes are retained as required.
Continuous improvement	Review false alarms, unnecessary activations, missed events, seasonal changes, and response time metrics to refine configuration.

10. Evaluation Checklist

Use the following checklist during site survey, proof-of-concept testing, tender preparation, or project handover. It is intentionally practical and can be adapted into an internal worksheet.

Area	Acceptance question	Done
Business objective	Risk and use case are clearly defined	☐
Site survey	Distances, mounting points, angles, blind spots, privacy constraints, and environmental conditions are documented	☐
Target definition	Target type, size, speed, direction, and required evidence quality are defined	☐
Lighting policy	IR mode, white LED mode, event activation logic, schedule, and duration are confirmed	☐
Camera selection	Resolution, lens/FOV, form factor, LED range, environmental rating, and analytics support are selected	☐
Analytics	Required event types are confirmed for the chosen product type, firmware, and configuration	☐
VMS/NVR integration	Video streams, event triggers, snapshots, metadata, and alarm actions are tested	☐
Cybersecurity	Accounts, passwords, network segmentation, update process, and secure access are reviewed	☐
Acceptance test	Pass/fail criteria, test objects, distances, activation behavior, alarm latency, and reporting are agreed	☐
Operations	SOP, escalation path, training, maintenance, and reporting are completed	☐

Suggested POC success metrics

- Detection accuracy for agreed target types and distances.
- False alarm and unnecessary white-light activation rate under normal operating conditions.
- Alarm latency from camera event to VMS/CMS operator notification.
- Quality of color evidence during white LED activation.
- Operator response time and action completion rate.
- Evidence completeness: event clip, timestamp, color image, event type, and operator notes.

11. Related Keywords and Terminology

The following keyword reference groups collect common terms related to Smart Dual Light surveillance, dual-light cameras, active deterrence, color night vision, event-based lighting, and video security operations.

Core topic keywords

Smart Dual Light, dual light camera, smart dual light camera, dual-light surveillance, IR and white LED camera, infrared and white light camera, intelligent illumination camera, event-based lighting camera, smart illumination surveillance, night surveillance camera, color night vision camera, active deterrence camera, white LED security camera, IR LED security camera, smart LED surveillance camera

Night surveillance keywords

night vision camera, color night vision, full color night camera, low light surveillance camera, zero-light surveillance, nighttime intrusion detection, night security monitoring, after-hours surveillance, dark scene monitoring, IR night mode, white light night mode, night evidence capture, night perimeter monitoring, 24/7 surveillance camera

Deterrence and evidence keywords

active deterrence surveillance, intruder deterrence camera, white light deterrence, visible light deterrence, color evidence camera, color evidence at night, vehicle color capture, clothing color evidence, incident verification camera, alarm verification camera, event-triggered white light, security lighting integration, deterrence workflow

AI and event keywords

AI dual light camera, AI people detection camera, AI vehicle detection camera, people detection lighting, vehicle detection lighting, motion-triggered white LED, sound-triggered white LED, event-based camera lighting, line crossing light activation, intrusion zone light activation, AI video analytics camera, smart event camera, video metadata, VMS event integration

System integration keywords

dual light camera NVR integration, dual light camera VMS integration, smart dual light CMS, IP camera event workflow, security camera alarm output, camera event notification, video management system integration, control center surveillance, multi-site security monitoring, alarm pop-up, event clip recording, security operator workflow, access control video verification

Industry and vertical-market keywords

factory night surveillance, warehouse night security, logistics yard camera, parking lot dual light camera, school perimeter camera, government facility surveillance, utility site surveillance, construction site security camera, retail after-hours security, campus night monitoring, office building perimeter security, industrial active deterrence, critical infrastructure night surveillance, remote site security camera

Specification and procurement keywords

dual light camera specification, smart dual light tender, smart dual light procurement, white LED range camera, IR LED range camera, camera field of view, outdoor dual light camera, vandal resistant camera, weatherproof security camera, PoE dual light camera, ONVIF camera, cybersecurity camera, camera acceptance testing, lighting policy, false alarm reduction

Common question phrases

what is Smart Dual Light, how does a dual light camera work, IR vs white LED camera, when to use white LED security cameras, how to capture color evidence at night, how to deter intruders with camera lighting, how to reduce white light disturbance, how to configure event-based lighting, how to choose a dual-light camera, what is active deterrence surveillance, why use Smart Dual Light cameras

Additional related terms

smart lighting security, intelligent camera illumination, visible-light alarm, IR to white light switching, automatic white LED activation, event-based night color, nighttime video verification, security light trigger, video surveillance lighting design, after-hours intrusion deterrence, light pollution reduction, camera-based deterrence, perimeter light activation, night monitoring SOP, camera deployment planning

12. Source Notes

This white paper is based on ACTi public source pages and general video surveillance system-design practices. Product details should always be reconfirmed against the latest ACTi datasheets, firmware release notes, regional availability, and quotation documents before formal project commitment.

Ref.	Source
[1]	ACTi Corporation, 'Smart Dual Light', official technology page. URL: https://www.acti.com/technologies/smart-dual-light . Accessed: May 6, 2026.
[2]	ACTi Corporation, 'About ACTi', official corporate page. URL: https://www.acti.com/corporate . Accessed: May 6, 2026.

Revision note

This document is a marketing and technical education white paper. It is not a regulatory certification, safety standard, or final project design. Always validate detection performance, lighting behavior, privacy requirements, and operator response workflow in the target scene before deployment.

Prepared by ACTi Corporation

For Smart Dual Light projects, confirm product type selection, analytics capability, system integration, mounting accessories, and regional availability with your ACTi sales contact or authorized system integrator.

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