ACTi

Physical Security End-to-End Solution Provider

White Paper | LightGuard

# LIGHTGUARD

Night-time precision security for moving-target identification, clear evidence, and AI-assisted operator response

Prepared by ACTi Corporation

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# Contents



**Document purpose**

This white paper explains the value of LightGuard for professional security projects and positions ACTi low-light, moving-target identification 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

LightGuard is ACTi's night-time precision security technology for capturing clearer evidence of moving targets in darkness. Instead of simply brightening the whole scene, LightGuard focuses on target identity: faces, license plates, vehicle details, and small but important objects that operators need for verification and investigation.

ACTi describes LightGuard as low-light image processing that combines a large sensor, fast shutter speed, large aperture lens, and AI-based image enhancement. The goal is to provide undisputable evidence and identity of moving targets, especially where conventional cameras suffer from motion blur after slowing shutter speed to gain more light. [1]

For end users, the strategic value is clearer night-time evidence and faster decision-making after an alarm. For consultants, LightGuard provides a practical way to specify moving-target evidence quality, not only minimum illumination. For system integrators, it supports higher-value solutions for night traffic, parking lots, campuses, retail exteriors, and other after-hours monitoring sites.

**Core message**

LightGuard should be evaluated as an evidence and response technology: capture moving targets with less blur, enhance identity details, notify operators, verify incidents, and retain usable evidence for investigation.

## Key takeaways

- Moving targets are the hardest night-time surveillance challenge because slow shutter speed can create blur.
- LightGuard combines sensor, optics, exposure control, and AI enhancement to prioritize target identity over general scene appearance. [1]
- License plates, facial details, vehicle features, and small identity clues become more valuable when noise and blur are reduced.
- Signal-to-noise ratio, shutter behavior, lens aperture, field of view, distance, and target speed are key project evaluation factors.
- Deployment quality matters: lighting, camera height, target angle, vehicle speed, VMS/NVR workflow, and response SOPs determine the final operational 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. [2]

ACTi's portfolio covers video surveillance, access control, control center operation, system management, and integration with third-party systems. Its official corporate materials describe products and solutions including IP cameras, analog cameras, network video recorders, hybrid DVR, software and standalone VMS options, workstation applications, web clients, access control systems, central management, system health management, and third-party integration. [2]

ACTi also emphasizes AI-enabled security. Its AI solution platform supports detection, tracking, counting, classification, recognition, and identification of people, faces, vehicles, license plates, and other object types. For LightGuard projects, this matters because clearer night video becomes more useful when it can be recorded, searched, verified, escalated, and connected to a response workflow. [2]

## Why ACTi is relevant to LightGuard projects

| ACTi strength | Project relevance |
|---|---|
| End-to-end system scope | LightGuard cameras can be planned together with VMS, NVR, central monitoring, access control, alarms, and third-party systems instead of being treated as isolated devices. |
| Security-industry experience | ACTi's corporate materials state more than 20 years of security-industry experience and adoption across vertical markets. [2] |
| AI and metadata direction | Low-blur night video supports clearer analytics input, faster operator verification, and more meaningful incident evidence. |
| Integrator-friendly portfolio | Multiple camera form factors allow system integrators to match low-light moving-target identification to different sites, distances, budgets, and mounting conditions. |

# 3. What LightGuard Means

LightGuard means designing the night image pipeline around moving-target identity. ACTi explains that when there is not enough light, a conventional camera may use slower shutter speed to collect more light, but this makes moving objects appear blurred and difficult to identify. [1]

LightGuard addresses that problem by combining a large sensor, fast shutter speed, large aperture lens, and AI-based image enhancement. ACTi states that the technology can reduce noise or blur while increasing object sharpness, making license plates, facial details, and other small but important objects more distinguishable. [1]

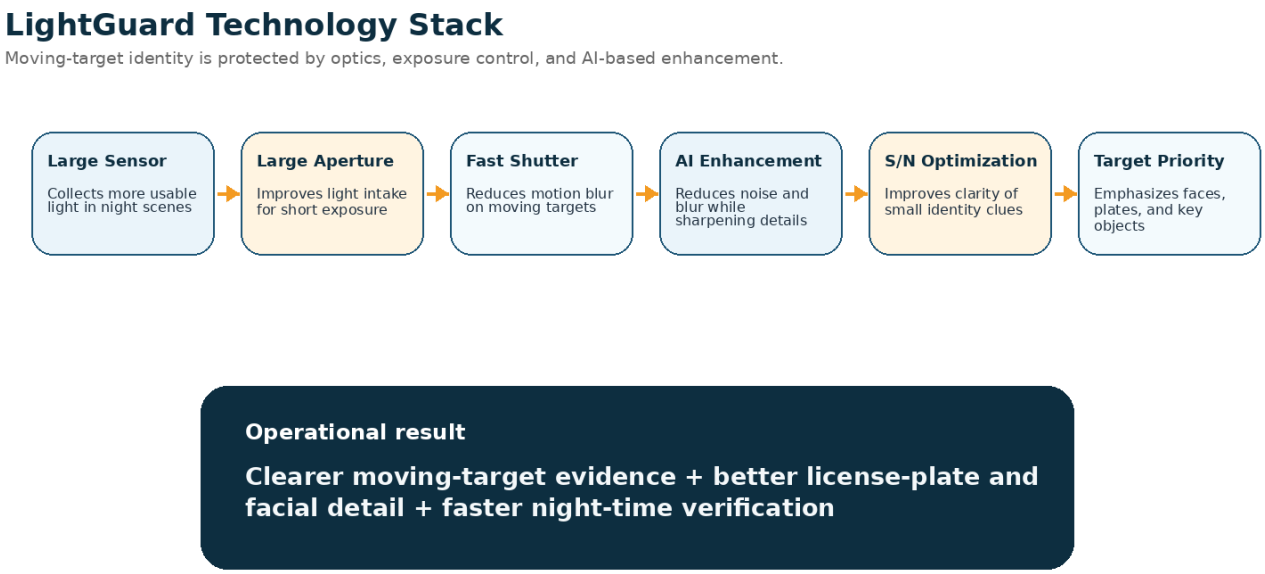
In practical terms, LightGuard shifts night surveillance from “see a brighter scene” toward “capture identity-relevant evidence from moving targets.” That distinction is important for traffic monitoring, parking areas, entrances, city surveillance, schools, retail stores, and other night-time environments. [1]

## LightGuard vs. conventional low-light surveillance

| Dimension | Conventional low-light surveillance | LightGuard surveillance |
|---|---|---|
| Primary goal | Improve general scene brightness in low light. | Preserve useful identity details of moving targets at night. |
| Main challenge | Slow shutter speed may brighten the image but blur moving people or vehicles. | Fast shutter and image enhancement reduce motion blur while maintaining usable evidence. |
| Evidence value | Operators may see that motion occurred, but small identity details can be unclear. | Faces, plates, vehicle details, and small objects become more distinguishable. |
| AI input quality | Blurred or noisy frames can limit reliable analysis. | Noise and blur reduction improves the quality of frames used for AI-assisted review. |
| Best combined use | Useful for general low-light observation. | Useful where target identity, license-plate readability, or fast night-time verification is required. |

# 4. Core Technical Concepts

LightGuard decisions should be made from both an imaging-performance perspective and an operational security perspective. The concepts below help project teams compare products accurately and avoid under-designed night-time deployments.




| Concept | Practical meaning |
|---|---|
| Large sensor | A larger sensor can collect more usable light, helping the camera preserve evidence while avoiding excessive blur from very slow exposure. ACTi identifies a large sensor as part of LightGuard. [1] |
| Large aperture lens | A large aperture allows more light into the camera, supporting clearer low-light capture. ACTi identifies a large aperture lens as part of LightGuard. [1] |
| Fast shutter speed | A faster shutter helps freeze moving vehicles or people, reducing the blur that makes identity details unreadable. ACTi identifies fast shutter speed as part of LightGuard. [1] |
| AI-based enhancement | AI-based image enhancement is used to reduce noise and blur while increasing sharpness of important objects. [1] |
| Signal-to-noise ratio | S/N ratio helps evaluate image noise. Less noise supports clearer evidence and makes small details easier to interpret. ACTi highlights S/N ratio as a way to evaluate lack of noise. [1] |
| Target-priority imaging | ACTi states that LightGuard prioritizes target identity rather than the overall appearance of the image. This helps procurement teams focus on evidence quality, not only a pleasing scene. [1] |

# 5. High-Value Applications

ACTi identifies night-time traffic monitoring as a typical LightGuard application and also describes use in city surveillance, parking lots, retail stores, schools, and other night-time monitoring environments. [1]

| Application | Operational value | Typical locations |
|---|---|---|
| Night-time traffic monitoring | Capture moving vehicles more clearly and support identification in darkness. | Roads, intersections, gates, transportation areas, city surveillance points. |
| License-plate evidence | Improve plate distinguishability when vehicles are moving at night. | Parking entrances, driveways, loading docks, checkpoints, perimeter roads. |
| Person identification support | Reduce blur and noise so facial details, clothing, carried objects, and direction are easier to verify. | Schools, retail exteriors, campuses, government buildings, offices. |
| Parking-lot security | Support after-hours vehicle and pedestrian verification with clearer moving-target evidence. | Outdoor parking lots, parking structures, ramps, visitor lots, employee lots. |
| Retail and commercial exteriors | Preserve usable evidence around entrances, service doors, sidewalks, and storefronts after dark. | Retail stores, malls, office buildings, hotels, restaurants. |
| Operator investigation workflow | Provide clearer clips and snapshots for faster incident review and escalation. | Control rooms, multi-site monitoring centers, critical facilities. |

## Value by stakeholder

| Stakeholder | Main benefit |
|---|---|
| Security manager | Better night-time evidence, fewer ambiguous incidents, and faster verification. |
| Control room operator | Clearer moving-target video helps operators understand the incident without relying only on shape or motion. |
| System integrator | Creates a higher-value solution conversation beyond standard camera replacement. |
| Consultant | Provides a practical specification language for moving-target evidence quality and low-light performance. |
| Procurement team | A well-scoped LightGuard system can improve risk reduction and investigation value without overcomplicating the project. |

# 6. System Architecture

Since LightGuard technology is inside the camera, the system value can extend to the VMS, NVR, and central monitoring layers that receive the video stream, event data, snapshots, and exported clips. The strongest deployments connect night-time evidence to operator workflows instead of treating the camera as an isolated device.


## Integration principle

**LightGuard creates value when it is connected to a workflow.**

A camera that captures clearer night video is useful; a camera that captures clearer night video, sends events, stores evidence, enables search, and guides operator action becomes a solution.

# 7. ACTi Product Portfolio Overview

ACTi positions LightGuard across low-light camera types and related recording or management platforms. This section intentionally describes product categories and form factors rather than specific model names, so the document remains stable as the portfolio evolves.

## Portfolio categories

| Category | Where it fits |
|---|---|
| Fixed bullet cameras | Outdoor fixed-view monitoring for roads, entrances, yards, perimeters, loading zones, parking areas, and building exteriors. |
| Zoom bullet cameras | Sites where adjustable field of view and target distance tuning are important for identity-level night evidence. |
| Fixed dome cameras | Indoor or sheltered installations where vandal resistance, appearance, or ceiling mounting is important. |
| Outdoor turret cameras | Compact fixed-view installations where flexible mounting angle and low-profile appearance are preferred. |
| Multi-imager cameras | Wide-area monitoring where multiple directions or broad coverage help reduce blind spots. |
| PTZ / speed dome cameras | Movable surveillance with optical zoom for patrol routes, wide-area monitoring, and operator-controlled investigation. |
| VMS, NVR, and central management | Recording, search, event handling, multi-site monitoring, TV wall operation, and evidence management. |

## Product planning note

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

**Stable specification approach**

For tenders and consultant specifications, define the required result: moving-target evidence at night, motion-blur control, S/N performance, AI-based enhancement, event integration, evidence retention, cybersecurity controls, and acceptance-test criteria.

# 8. Deployment and Procurement Guidance

LightGuard projects are most successful when site design begins with the evidence requirement rather than a camera model. A road project, a school entrance project, and a parking-lot project may all require clear night video, but their shutter behavior, lens selection, target speed, mounting height, VMS workflow, and acceptance test can be very different.

## Design questions before selecting a camera

- What must be identified or verified at night: face, license plate, vehicle, clothing, carried object, direction, behavior, or scene context?
- What is the maximum distance from camera to target, and how large must the target appear in the image?
- How fast will the target move, and what level of motion blur is acceptable?
- What lighting challenges exist: headlights, reflective surfaces, dark entrances, backlight, rain, fog, dust, or seasonal changes?
- Will operators use live view, event popups, map views, search tools, exported clips, or third-party alerts?
- What response action should happen after an alarm: guard dispatch, voice warning, access control action, email, VMS popup, CMS event, or escalation?
- What cybersecurity, privacy, retention, and audit requirements must be applied to video and metadata?

## Procurement specification checklist

| Procurement item | What to define |
|---|---|
| Evidence objective | Specify the required identity evidence and operator decision, not only resolution or minimum illumination. |
| Moving-target performance | Define target speed, test distance, shutter behavior, acceptable blur, and identity-level pass/fail criteria. |
| Low-light performance | Define sensor class, aperture, S/N expectations, scene lighting assumptions, and acceptance-test conditions. |
| Lens and FOV | Define field of view, mounting angle, target pixel size, plate/face capture zone, and site coverage. |
| AI and metadata | Confirm object types, enhancement behavior, event rules, firmware support, and VMS/NVR behavior. |
| Integration | Confirm video streams, event triggers, metadata, alarm actions, third-party integration, and export workflow. |
| Acceptance testing | Define target objects, vehicle speed, distance, lighting, motion blur tolerance, alarm latency, and pass/fail documentation. |

# 9. Operational Best Practices

LightGuard is an operational system, not only a device feature. The camera must be installed, configured, validated, monitored, and maintained in a way that matches the user's risk profile and evidence requirements.

## Configuration and alarm tuning

- Create separate rule profiles for roads, gates, parking areas, entrances, fence lines, loading docks, and restricted areas.
- Set image and exposure behavior based on the real site. Avoid relying only on factory defaults when targets move quickly or lighting is complex.
- Avoid placing key capture zones directly over reflective surfaces, moving headlights, bright signage, exhaust vents, or uncontrolled light sources unless the design accounts for them.
- Use schedule-based rules where risk and lighting conditions change by time of day, work shift, or site operating status.
- Combine LightGuard video with VMS/CMS layouts, maps, snapshots, event clips, and SOP instructions so operators know exactly what to do.
- Document the meaning of each alarm and the expected response action for guards, supervisors, facility managers, and investigation teams.

## Maintenance and governance

| Practice | Reason |
|---|---|
| Periodic night testing | Validate moving-target evidence under real lighting, weather, vehicle speed, and operating conditions. |
| Lens and housing cleaning | Dirt, water spots, insects, spider webs, or obstruction can reduce image quality and trigger unnecessary alarms. |
| Firmware control | Maintain firmware versions, release notes, update approvals, rollback plans, and cybersecurity review. |
| Operator training | Train operators to interpret enhanced night evidence correctly and avoid over-interpreting uncertain details. |
| Evidence review | Confirm that event clips, snapshots, timestamps, video streams, and metadata are retained as required. |
| Continuous improvement | Review false alarms, missed events, seasonal lighting changes, target speed, 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, evidence requirement, and use case are clearly defined. | ☐ |
| Site survey | Distances, mounting points, target path, lighting sources, glare, blind spots, and environmental conditions are documented. | ☐ |
| Target definition | Target type, size, speed, direction, plate/face capture need, and required confidence are defined. | ☐ |
| Camera selection | Form factor, lens/FOV, low-light performance, aperture, shutter behavior, and environmental rating are selected. | ☐ |
| Image quality | Night sharpness, noise level, motion blur, plate/face detail, and mixed-light detail are validated on site. | ☐ |
| AI / metadata | Required object detection, enhancement behavior, and event behavior are confirmed for the chosen firmware and configuration. | ☐ |
| VMS / NVR integration | Video streams, event triggers, snapshots, search, export, and alarm actions are tested. | ☐ |
| Cybersecurity | Accounts, passwords, network segmentation, update process, and secure access are reviewed. | ☐ |
| Acceptance test | Pass/fail criteria, target objects, speed, distances, lighting conditions, alarm latency, and documentation are agreed. | ☐ |
| Operations | SOP, escalation path, training, maintenance, and reporting are completed. | ☐ |

## Suggested POC success metrics

- Night-time moving-target usability for agreed target types, speeds, and distances.
- License-plate or facial-detail readability under agreed test conditions.
- False alarm rate under normal night operating conditions.
- Alarm latency from camera event to VMS/CMS operator notification.
- Quality of evidence in live view, snapshots, and exported clips.
- Evidence completeness: timestamp, event clip, target detail, metadata, and operator notes.

# 11. Related Keywords and Terminology

The following keyword reference groups collect common terms related to LightGuard, low-light moving-target identification, AI-based image enhancement, and video security operations.

### Core LightGuard keywords

LightGuard, LightGuard camera, LightGuard surveillance, night-time precision security, moving target identification camera, low light moving target camera, AI image enhancement camera, clear evidence at night, night evidence camera, target identity surveillance, low light security camera, night-time security camera, ACTi LightGuard, ACTi low light camera, identity-focused night surveillance

### Low-light imaging keywords

low light surveillance, extreme low light camera, large sensor security camera, large aperture security camera, fast shutter security camera, motion blur reduction camera, noise reduction camera, S/N ratio camera, signal-to-noise ratio surveillance, sharpness enhancement camera, night image processing, low-light image enhancement, mixed lighting surveillance, night-time object sharpness

### Traffic and vehicle keywords

night traffic monitoring, license plate evidence camera, license plate readability at night, moving vehicle identification, parking lot security camera, parking entrance camera, vehicle detail camera, road surveillance camera, intersection surveillance, driveway surveillance camera, gate monitoring camera, loading dock surveillance, vehicle evidence camera, after-hours vehicle monitoring

### AI and operator workflow keywords

AI video analytics, AI security camera, AI-based image enhancement, AI event detection, object sharpness enhancement, people detection camera, vehicle detection camera, event verification camera, video metadata search, smart event verification, deep learning surveillance camera, operator verification workflow, VMS evidence review, NVR event recording

# 11. Related Keywords and Terminology

### Security and investigation keywords

night intrusion verification, clear night video evidence, suspect tracking camera, vehicle tracking at night, face detail camera, facial detail surveillance, small object evidence camera, after-hours monitoring, security event verification, post incident investigation, forensic video evidence, motion blur control, target identity evidence, night-time operator verification

### Vertical-market keywords

city surveillance camera, campus night surveillance, school security camera, retail store night surveillance, government facility surveillance, factory security camera, warehouse night surveillance, logistics yard surveillance, parking lot night camera, public area surveillance, transportation security camera, critical facility surveillance, office building security camera, hotel perimeter camera

### System architecture keywords

VMS integration, NVR integration, central monitoring system, multi-site monitoring, TV wall monitoring, event-driven surveillance, video alarm workflow, security SOP integration, event metadata management, video evidence retention, PoE surveillance network, VLAN surveillance network, secure camera network, video stream recording

### Procurement and project keywords

best low light security camera, best camera for moving targets at night, camera for license plates at night, camera for face detail at night, low light camera for system integrators, AI camera for consultants, night surveillance acceptance testing, camera specification checklist, LightGuard white paper, low light surveillance white paper, video surveillance procurement guide, night-time evidence specification

### Common question phrases

what is LightGuard, how does LightGuard work, how to reduce motion blur at night, why fast shutter matters in surveillance, what is S/N ratio in cameras, how to capture license plates at night, how to improve night surveillance evidence, how to choose a low light security camera, how to reduce false alarms at night, what is AI image enhancement, how can AI improve night video

# 12. Source Notes

This white paper is based on ACTi public source pages, the supplied ACTi white paper layout reference, 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, “LightGuard,” official technology page. URL: https://www.acti.com/technologies/lightguard. Accessed: May 13, 2026. |
| [2] | ACTi Corporation, “About ACTi,” official corporate page. URL: https://www.acti.com/corporate/about. Accessed: May 13, 2026. |
| [3] | ACTi Corporation, “Thermal Surveillance White Paper,” supplied as layout and structure reference by the requester. Used for document consistency, not as the technical source for LightGuard content. |

**Revision note**

This document is a marketing and technical education white paper. It is not a regulatory certification, safety standard, final project design, or guarantee of detection performance. Always validate image quality, analytics behavior, and operator workflow in the target scene before deployment.

# Prepared by ACTi Corporation

For LightGuard projects, confirm camera type selection, analytics capability, system integration, mounting accessories, firmware behavior, and regional availability with your ACTi sales contact or authorized system integrator.

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