

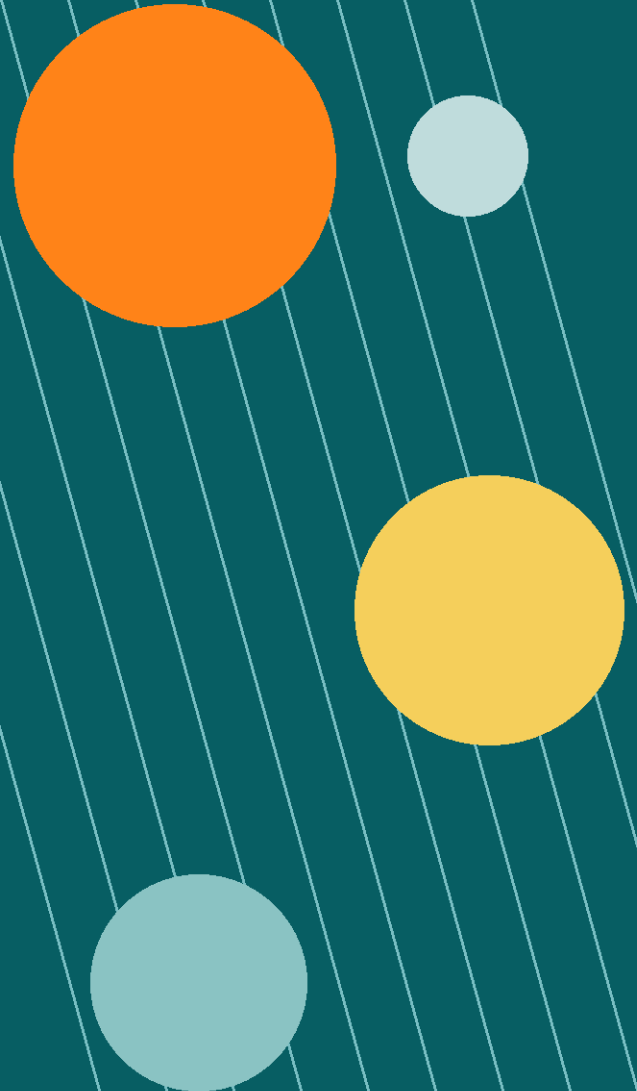
ACTi

Physical Security End-to-End Solution Provider

White Paper | Panoramic Cameras

PANORAMIC CAMERAS

A practical white paper for designing 180-degree and 360-degree video surveillance systems with continuous overview, dewarping, multi-imager coverage, and usable evidence workflow.



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Document purpose

This white paper explains what panoramic cameras mean in professional video surveillance and how they should be specified, deployed, and evaluated. It is written for system integrators, consultants, security managers, facility managers, and procurement teams that need wide-area awareness, blind-spot reduction, scene-wide evidence, efficient installation, and practical incident review.

The document references ACTi public product information for the Panoramic Cameras category and ACTi corporate information. It avoids model-specific naming so the content remains useful even as individual part numbers or product generations change.

Reading guide

Use Sections 3 and 4 to define requirements, Section 5 to map use cases, Section 6 to check architecture, and Section 7 to align ACTi panoramic form factors with project needs.

1. Executive Summary

Panoramic cameras help surveillance teams monitor a wide area with fewer devices while maintaining continuous overview. Depending on camera type, mounting method, and lens or sensor arrangement, panoramic surveillance can provide 360-degree ceiling views, 180-degree wall views, or wide multi-imager coverage for indoor and outdoor scenes.

ACTi positions its Panoramic Cameras category as 360 panoramic camera solutions that include hemispheric, fisheye, and multi-imager panoramic security cameras for indoor and outdoor coverage. ACTi also highlights 360-degree ceiling / 180-degree wall use cases, high-resolution options, deep-learning analytics, two-way audio or built-in microphone options, Extreme WDR, flexible installation methods, and compliance options such as NDAA and TAICS. [1]

For system integrators, panoramic cameras create differentiation when proposals reduce blind spots, simplify cabling, lower camera count, and improve incident review. For consultants and end users, the correct specification should define coverage angle, mounting position, resolution target, dewarping or stitching method, pixels-on-target, lighting condition, WDR need, analytics requirement, channel licensing, recording profile, and evidence workflow.

Core message

Panoramic cameras should be specified as a complete coverage and evidence system. Lens geometry, sensor layout, dewarping, stitching, resolution, WDR, low-light performance, analytics, recording, playback, export, and operator workflow all affect whether the system can support useful live monitoring and forensic review.

Key takeaways

- Panoramic value comes from constant overview, wide coverage, and blind-spot reduction.
- Hemispheric and fisheye cameras use a single wide-angle lens; the corrected view depends on dewarping.
- Multi-imager panoramic cameras use multiple sensors/lenses and can provide higher detail across a wide scene.
- 180-degree versus 360-degree coverage depends on mounting, scene geometry, and device type.
- VMS/NVR support, licensing, aspect ratio handling, recording profile, and evidence export are essential project factors.

Procurement principle

Do not specify panoramic only as a camera label. Specify target scene, coverage angle, mounting orientation, dewarping or stitching approach, evidence objective, analytics workflow, VMS/NVR behavior, recording, review, export, and maintenance access together.

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 states that it has more than 20 years of security-industry experience and has been a pioneer in video-based security technology development and innovation. [2]

ACTi positions itself as a physical security end-to-end solution provider. Its ecosystem includes IP cameras, recording platforms, VMS, access control, central management, system health management, AI-enabled video technologies, and third-party system integration. [2]

This broader ecosystem matters for panoramic projects. A camera may capture a scene-wide view, but the project succeeds only when operators can view corrected images, record the correct stream, search the scene, retrieve evidence, coordinate alarms, and maintain system health.

Why ACTi is relevant to panoramic projects

ACTi strength	Project relevance
End-to-end system scope	Panoramic cameras can be planned together with NVR, VMS, CMS, access control, alarms, third-party systems, and health management instead of being treated as isolated devices.
Clear video as a foundation	Scene-wide monitoring depends on clear source video, sufficient resolution, stable recording, and usable playback.
AI-enabled platform	Panoramic projects can combine overview video, event metadata, detection, recognition, and response workflow when scene design supports the intended analytics.
Compliance and project fit	ACTi public pages reference compliance considerations such as NDAA, TAICS, and vertical-market requirements. [1][2]

3. Definition of "Panoramic Cameras"

A panoramic camera is a video surveillance camera designed to capture a very wide field of view, often 180 degrees or 360 degrees, so that one device can monitor an entire area or a broad scene. In professional security design, panoramic means more than a wide lens: it also includes how the image is corrected, stitched, displayed, recorded, searched, and exported.

ACTi describes panoramic camera solutions as hemispheric and fisheye options for 360-degree ceiling or 180-degree wall views, plus multi-imager panoramic security cameras for indoor and outdoor coverage. [1]

Project teams should treat panoramic surveillance as both a camera capability and a system workflow: what area must remain continuously visible, how users view corrected images, what detail is required, how many VMS channels are used, how recorded video is reviewed, and whether analytics can operate on the selected stream.

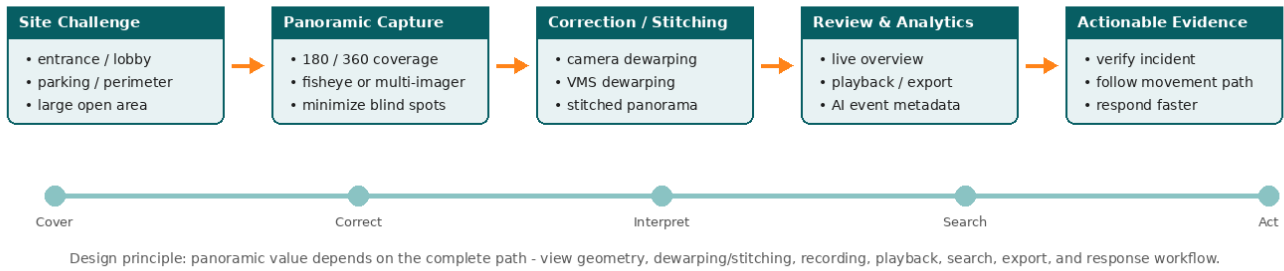
Panoramic cameras vs. related concepts

Term	Meaning	Common misunderstanding
Panoramic camera	Camera type designed for wide scene coverage, typically using fisheye/hemispheric optics or multiple imagers.	It is not automatically high-detail everywhere; pixel density still depends on resolution, lens, distance, and scene size.
Hemispheric camera	Single fisheye-lens camera with built-in dewarping that outputs corrected views to the VMS.	Dewarping simplifies viewing, but the original lens geometry still affects usable detail.
Fisheye camera	Single fisheye-lens camera that usually sends a raw circular view for VMS-side dewarping.	Raw fisheye video is not always operator-friendly without correction.
Multi-imager panoramic	Camera with multiple sensors/lenses arranged to create wide 180-degree or 360-degree coverage.	It can offer more pixels across the scene, but alignment, channel count, aspect ratio, and installation angle matter.
Dewarping / stitching	Digital image processing that corrects fisheye distortion or combines aligned sensor views.	Correction does not create details that were not captured by the original pixels.

Visual concept

How panoramic cameras create scene-wide evidence value

From wide coverage to corrected views, searchable evidence, and faster response



Design note

A panoramic camera creates value when it can keep a broad scene visible and then provide corrected, searchable, and exportable evidence after an incident. The complete chain must be planned: scene coverage, mounting orientation, view correction, VMS display, recording, playback, analytics, evidence export, and response.

4. Core Technical Concepts

Camera selection should begin with the monitoring problem. The goal is to preserve usable scene awareness and evidence detail at the distance, angle, lighting condition, and review workflow that matter to the project. The following concepts help teams avoid under-designed specifications.

Concept	Practical meaning
Coverage angle and mounting	Define whether the project requires 180-degree wall coverage, 360-degree ceiling coverage, a corridor-style view, or a large outdoor overview. Mounting height and tilt strongly affect usable image area.
Resolution and pixels-on-target	High total resolution does not guarantee useful detail everywhere. Specify target distance, scene width, and evidence objective to estimate pixels-on-target.
Hemispheric vs. fisheye dewarping	ACTi explains that hemispheric cameras perform dewarping inside the camera, while fisheye cameras can send raw fisheye video for VMS-side dewarping. [3]
Multi-imager stitching and streams	Some multi-imager cameras provide individual video streams, while others stitch aligned views into one wide stream. VMS layout and licensing should be confirmed. [4]
WDR, low light, and IR	Wide scenes often include doors, windows, headlights, or dark corners. WDR, illumination, and sensor performance determine whether the overview remains usable.
Analytics suitability	People, vehicle, face, or ALPR analytics depend on target size, viewing angle, image quality, stream type, and scene design. Validate analytics in representative conditions.
Recording and evidence workflow	The system must record the intended view, stream, metadata, timestamp, and export quality while users switch layouts, dewarp, or review incidents.

Specification interpretation

A high-resolution panoramic camera can still fail if it is installed too high, dewarped incorrectly, viewed in the wrong aspect ratio, or recorded at an insufficient bit rate. Conversely, a moderate panoramic solution can perform well when coverage, mounting, resolution, lighting, VMS support, and review workflow are carefully designed.

Capability matrix

Scene challenge to panoramic capability matrix

Match the monitoring problem with the full camera and system settings required for usable scene-wide evidence.

Scene challenge	What can go wrong	Capabilities to specify
Large open area	Standard fixed cameras leave blind spots or require many devices.	180/360 coverage, mounting height, sensor/lens type, overlap strategy, live display layout.
Entrance or lobby coverage	People move in different directions and may pass through edge areas.	Ceiling or wall orientation, dewarped view, sufficient pixel density, WDR, playback layout.
Parking lot or perimeter	Wide scenes need overview but also evidence for vehicles or events.	Multi-imager option, outdoor rating, IR/lighting, frame rate, storage, analytics validation.
Low light or backlight	The scene becomes noisy, dark, or washed out near doors and windows.	Low-light sensitivity, WDR, IR or white-light design, exposure settings, representative testing.
Incident review	Raw fisheye or wide views can be difficult to interpret after an event.	Dewarping/stitching method, playback support, export format, timestamp, user training.

How to use this matrix

Use the matrix during site survey and proposal design. Each monitoring problem should be translated into a camera requirement, a network/recording requirement, and an operator-review requirement. This reduces the risk of specifying panoramic hardware while leaving the rest of the system unable to preserve or use the captured detail.

5. High-Value Applications

Panoramic cameras are most valuable where teams need continuous overview, blind-spot reduction, efficient device count, and practical incident review. ACTi highlights panoramic camera usage for entrances, lobbies, concourses, parking lots, and indoor/outdoor coverage. [1]

Application	Operational value	Typical locations
Entrances and lobbies	Maintain continuous awareness of people flow while supporting corrected views for review.	Building entrances, reception areas, lobbies, public counters
Retail and commercial spaces	Reduce blind spots and simplify investigation of movement paths or customer/service incidents.	Stores, showrooms, aisles, cash areas, common spaces
Parking and traffic-adjacent areas	Observe broad areas and support investigation of vehicles, entrances, and incidents.	Lots, garages, gates, loading zones, driveways
Campuses and education	Cover shared open areas, halls, cafeterias, event spaces, and entrances with fewer units.	Schools, universities, sports buildings, common areas
Industrial and logistics sites	Monitor large operational areas and support event review across zones.	Factories, warehouses, yards, docks, logistics hubs
Multi-site monitoring	Standardize wide-area views for centralized operators and remote review.	Retail chains, corporate campuses, distributed facilities

Value by stakeholder

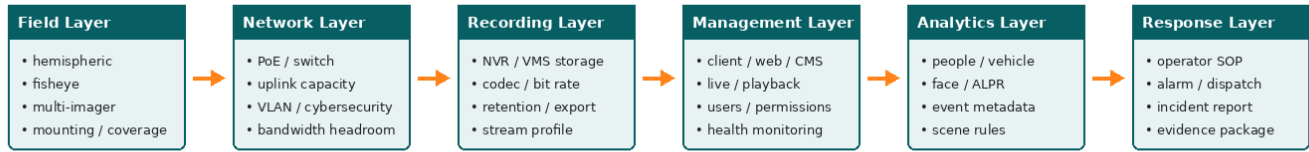
Stakeholder	Main benefit
System integrator	Stronger differentiation when proposals reduce camera count, cabling, licenses, blind spots, and review complexity.
Consultant	Clearer specification language for coverage angle, dewarping, stitching, resolution, WDR, integration, retention, and evidence export.
Security manager / operator	More reliable scene awareness, incident path review, alarm verification, and evidence reconstruction.
Procurement team	A more defensible buying decision based on application fit, compliance readiness, and total evidence workflow.

6. System Architecture

Panoramic should be designed as a system architecture. The camera creates the wide view, but the full solution must preserve operational value through correction, transmission, recording, storage, live viewing, playback, search, export, alarm handling, and response. If any layer is under-designed, the project may lose evidential value.

Reference system architecture

Panoramic project value depends on the complete path from scene capture to response workflow



Key question: Can users reliably view, record, dewarp, search, export, and act on the details captured?

Architecture layers

Layer	Role in panoramic surveillance
Field layer	Panoramic type, lens/sensor layout, resolution, WDR, lighting, mounting height, viewing angle, target distance, weather exposure, and maintenance access.
Network layer	PoE, switching, uplink capacity, fiber or wireless links, VLANs, latency, cybersecurity controls, remote access, and bandwidth headroom.
Recording layer	NVR or VMS storage, codec, bit rate, frame rate, retention period, redundancy, backup, playback performance, and export workflow.
Management layer	Client software, web access, CMS, display layout, user permissions, multi-site monitoring, event review, and system health management.
Analytics layer	People, vehicle, face, or license-plate analytics; analytic performance depends on image quality, target size, scene design, stream type, and metadata handling.
Response layer	Operator SOPs, alarms, access-control action, guard dispatch, escalation, incident reporting, evidence export, and audit trail.

Architecture warning: A camera that looks excellent in a datasheet can still underperform if the VMS cannot dewarp or display the stream correctly, if channel licensing is misunderstood, if bandwidth is underestimated, or if playback/export workflow is not validated.

7. ACTi Product Portfolio Overview

ACTi positions its Panoramic Cameras category as a portfolio for 360 panoramic camera solutions, including hemispheric, fisheye, and multi-imager panoramic security cameras. The public page highlights 360-degree ceiling / 180-degree wall views, indoor and outdoor options, resolution up to 20MP, deep-learning analytics, two-way audio or built-in microphone options, Extreme WDR, flexible installation methods, and compliance options such as NDAA and TAICS. [1]

Portfolio categories

Category	Where it fits	Use-case fit
Hemispheric camera	Single fisheye-lens form factor with built-in dewarping for corrected views.	Entrances, lobbies, retail, indoor open areas, compact outdoor overview points.
Fisheye camera	Single fisheye-lens form factor that can rely on VMS-side dewarping.	Cost-sensitive overview projects where VMS dewarping and operator workflow are confirmed.
Multi-imager panoramic camera	Multiple sensors/lenses creating wide 180-degree or 360-degree coverage, sometimes as stitched streams.	Large scenes, irregular layouts, parking areas, perimeter points, and sites requiring more pixels across the scene.
Indoor panoramic form factor	Compact dome or cube-style installation for interior environments.	Lobbies, halls, stores, corridors, classrooms, public counters.
Outdoor panoramic form factor	Weather-ready dome, turret, bullet, or multi-imager design for exterior environments.	Parking lots, entrances, loading zones, campuses, industrial yards, outdoor public areas.

Portfolio-level capabilities to confirm

- Required form factor, mounting method, coverage area, target distance, target size, and lighting condition.
- Required coverage angle, resolution, dewarping or stitching method, WDR, low-light performance, audio, and analytics use case.
- Recorder/VMS compatibility, channel licensing, display aspect ratio, bit rate, codec, retention, playback, evidence export, CMS, and remote access requirements.
- Environmental casing, operating temperature, vandal resistance, mounting accessories, and maintenance access.
- Cybersecurity and compliance requirements such as NDAA, TAICS, firmware policy, secure access, and regional availability.

Project note: Product availability, detailed specifications, compliance status, recorder compatibility, and regional part numbers should be confirmed from the latest ACTi product pages, datasheets, firmware release notes, and quotation documents before project submission.

8. Related Keywords and Terminology

The following keyword reference groups collect common terms related to panoramic surveillance, fisheye and hemispheric imaging, multi-imager coverage, dewarping, system architecture, and project procurement.

Core topic keywords

panoramic camera, panoramic security camera, panoramic surveillance camera, 360 camera, 180 camera, 360 degree camera, 180 degree camera, wide area surveillance camera, wide angle IP camera, overview camera

Hemispheric and fisheye keywords

hemispheric camera, fisheye camera, fisheye security camera, fisheye dome camera, ceiling mounted 360 camera, wall mounted 180 camera, circular fisheye view, corrected panoramic view

Multi-imager keywords

multi-imager camera, multi-sensor camera, panoramic multi-imager, multi-directional camera, 180 degree multi-imager, 360 degree multi-imager, stitched panoramic video, multi-channel panoramic camera

Image processing keywords

dewarping, camera dewarping, VMS dewarping, image stitching, panoramic stitching, corrected view, panorama view, quad view, view mode, aspect ratio handling

Image quality and evidence keywords

20MP panoramic camera, high-resolution panoramic camera, WDR panoramic camera, low-light panoramic camera, IR panoramic camera, pixels on target, scene-wide evidence, blind spot reduction

Analytics keywords

AI panoramic camera, people detection panoramic camera, vehicle detection panoramic camera, face recognition camera, ALPR camera integration, object metadata, alarm verification camera

Application keywords

lobby surveillance camera, entrance surveillance camera, retail surveillance camera, parking lot panoramic camera, campus surveillance camera, warehouse overview camera, logistics security camera, public area monitoring

System and architecture keywords

IP camera system, NVR camera system, VMS camera system, CMS surveillance, remote security monitoring, video retention planning, evidence export workflow, panoramic bandwidth planning

Procurement and project keywords

panoramic camera specification, panoramic camera selection guide, surveillance camera white paper, camera for system integrators, camera for consultants, camera for end users, NDAA security camera, TAICS security camera, ACTi panoramic camera

Common question phrases

what is a panoramic camera, what is the difference between fisheye and hemispheric cameras, when do I need a 360 camera, when should I use 180-degree panoramic surveillance, how does dewarping work, camera-side dewarping vs VMS-side dewarping, how to choose panoramic camera resolution, how many VMS channels does a multi-imager camera need, how to record panoramic evidence, how to export dewarped video, how to design panoramic surveillance for lobbies, how to design panoramic surveillance for parking lots, when to use multi-imager cameras, how to reduce blind spots in video surveillance

Source notes

Ref.	Source
[1]	ACTi Corporation, "Panoramic Cameras," official product category page. URL: https://www.acti.com/products/panoramic-cameras . Accessed: June 15, 2026.
[2]	ACTi Corporation, "About ACTi," official corporate page. URL: https://www.acti.com/corporate/ . Accessed: June 15, 2026.
[3]	ACTi Corporation, "Hemispheric Surveillance," official technology page. URL: https://www.acti.com/technologies/hemispheric-surveillance . Accessed: June 15, 2026.
[4]	ACTi Corporation, "Multi-Imager Surveillance," official technology page. URL: https://www.acti.com/technologies/multi-imager-surveillance . Accessed: June 15, 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 coverage area, viewing distance, field of view, resolution, mounting orientation, dewarping, stitching, WDR, lighting, recording settings, storage, VMS/NVR behavior, user permissions, and operator workflow in the target scene before deployment.

Prepared by ACTi Corporation

For panoramic camera projects, confirm camera type selection, lens/sensor arrangement, lighting, recording platform, compliance requirements, mounting accessories, and regional availability with your ACTi sales contact or authorized system integrator.

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