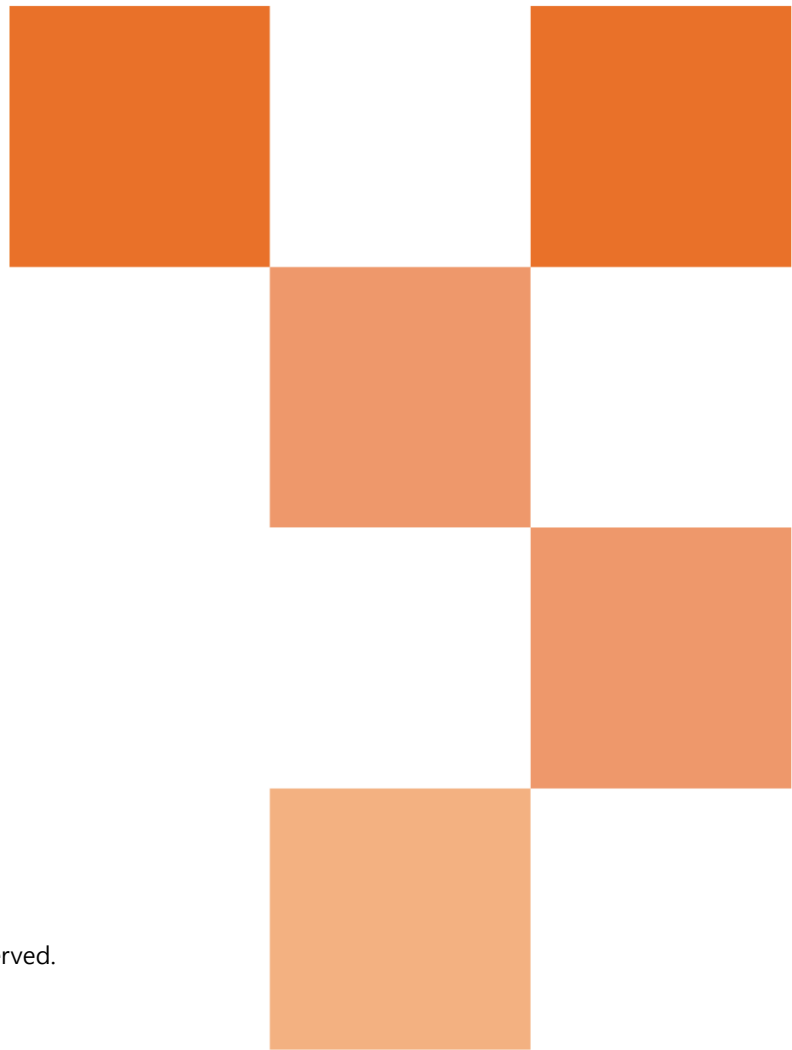


White Paper

Modular Design

April 2026



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1. Background

In large-scale video surveillance deployments, the TCO (Total Cost of Ownership) is influenced far more by installation, maintenance, and upgrade cycles than by the initial hardware purchase. Traditional fixed-body systems often require complete unit replacements for component failures or technology refreshes, resulting in duplicated costs for housings, mounts, and installation labor.

Every minute spent on a ladder during camera replacement or system configuration directly translates to operational disruption and labor costs. Hanwha Vision recognized that these inefficiencies created a significant opportunity for innovation. By decoupling the core camera components from the peripheral infrastructure, we provide a scalable, service-friendly foundation for long-term video infrastructure planning.

2. Modular Camera structure (Anatomy)

The modular system is engineered to separate the "brain" of the camera from its protective "shell". This structure allows specialized components to be serviced or upgraded without disturbing the underlying infrastructure.



Figure 1. The Anatomy of a Modular Camera

The Mount Plate & Bottom Cover: The permanent anchor point. Once wired and installed, this component serves as a permanent foundation throughout the system's lifecycle.

The Camera Module: This internal core contains the sensors, lenses, and processing unit. It is the only part that needs to be swapped during a technology refresh or service call.

The Dome Cover: A ruggedized exterior that provides environmental protection and vandal resistance.

Magnetic Alignment: High-strength magnetic guides allow technicians to "snap" the camera module into the base. This eliminates the need to manage tiny screws while several feet in the air, significantly reducing labor liability and installation errors.

Component	Primary Function	Modular Benefit
Plate/Bottom cover	Provides physical anchoring and electrical termination.	Zero-disturbance wiring during future sensor upgrades.
Camera Module	Captures video, processes analytics, and stores data.	Minimize "ladder time" by snapping in new technology.
Dome Cover	Protects optics with specialized weatherproofing.	Integrated case tampering detection triggers instant alarms.
Accessories	Meets the needs of various installation conditions.	Common accessories are used making ordering, stocking, and upgrades easy.

Table 1. Function and benefit of each component

3. Strategic Packaging: Efficiency from Warehouse to Field

The modular design extends beyond the hardware into a specialized packaging structure designed to optimize the workflow for Systems Integrators (SIs) and dealers.

3.1. Pre-Configuration Without Unboxing

The product package is engineered to provide technicians with direct access to the camera's network port without removing the module from its protective box. This allows for convenient "pre-staging"—setting passwords, IP addresses, and parameters—in the office before field deployment, saving hours of on-site labor



Figure 2. Packaging structure of the modular camera designed for pre-configuration

3.2. Staged Logistics

Because the camera module and housing can be packaged or handled separately, dealers can quickly ship the housings and mounting plates to the job site for immediate installation by the wiring crew. Meanwhile, the high-value camera modules can remain at the configuration center for programming. This parallel workflow ensures that the most expensive components are only brought to the site when the infrastructure is ready, reducing the risk of theft or damage during construction.

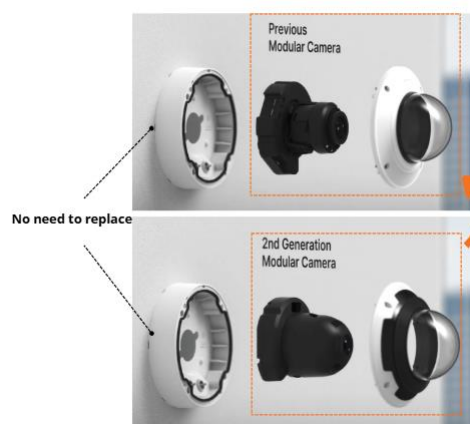


Figure 3. Example of replacing an existing model with the latest modular version



4. Key Benefit

The value of a modular approach is realized across the entire lifespan of the security system through three primary pillars:

Effortless Upgrades

- **Future-Proofing:** When a new generation of sensor technology or analytics becomes available, users only need to replace the internal camera module.
- **Component Reuse:** The existing housings, mounts, and accessories remain in place, ensuring that a "technology refresh" does not require a "construction project".

Enhanced Serviceability

- **Rapid Uptime:** If a module requires service, a technician can simply swap it for a spare in seconds using the magnetic mounting system.
- **Zero-Disturbance Wiring:** Since the base mount plate and wiring are never disturbed during a module swap, the risk of wiring faults or environmental seal breaches is virtually eliminated.

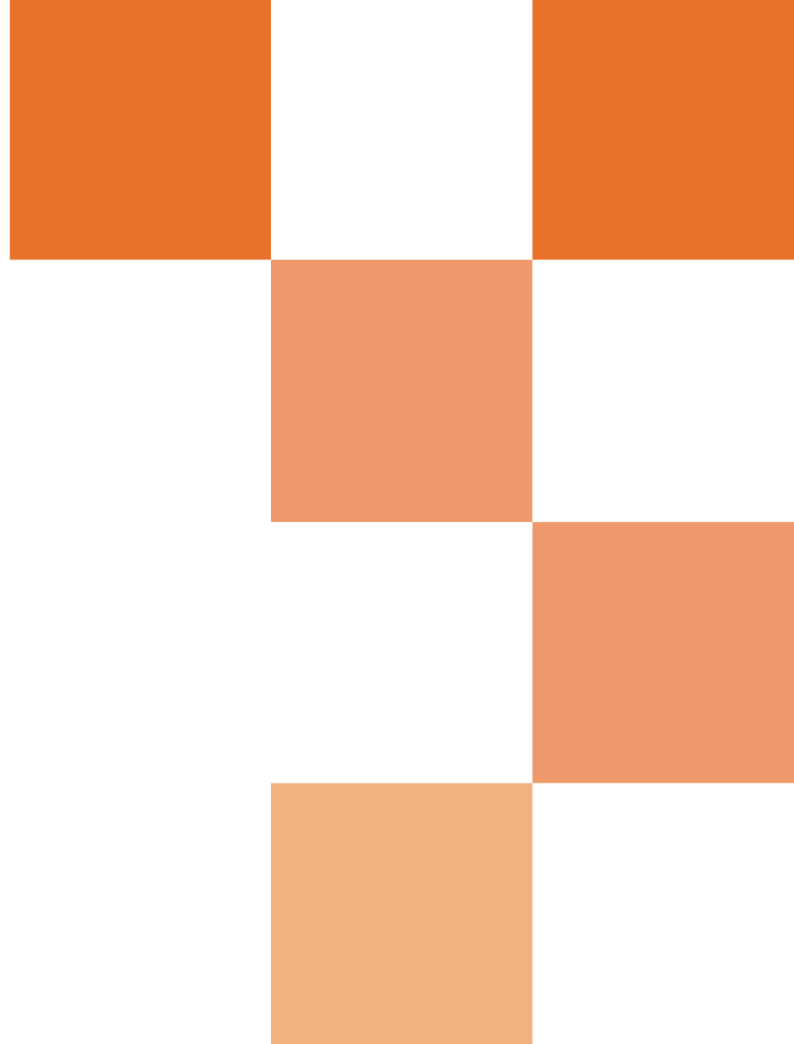
Measurable Cost Savings

- **Reduced Labor:** Faster installation and maintenance cycles save significant labor hours—approximately one minute of "ladder time" per camera across large deployments.
- **Lower Procurement Costs:** Purchasing a replacement module is significantly more cost-effective than purchasing a full camera unit, as customers do not pay for redundant housings and mounting hardware.



5. Conclusion

Hanwha Vision's modular ecosystem represents a forward-looking strategy for building adaptable and sustainable security infrastructures. By minimizing material waste and maximizing the operational lifespan of every component, we help our customers transform their surveillance system from a static investment into a living, future-ready infrastructure. Ultimately, this design is engineered to maximize return on investment, minimize environmental waste, and evolve seamlessly with the user's needs for years to come.



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