

**Panasonic**



**INTELLIGENT VIDEO ANALYTICS**  
**LEVERAGE REAL-TIME VIDEO SURVEILLANCE DATA**  
**FOR POWERFUL BUSINESS DECISIONS**

**i-PRO**  
**SmartHD**



## BEYOND VIDEO: INTELLIGENT BUSINESS ANALYTICS

Intelligent Video (IV) is also referred to as Video Content Analysis (VCA) or Video Analytics (VA). It performs automatic analysis of your video surveillance stream and extracts useful information, such as the detection of an intruder in your images. Typical applications for Intelligent Video are video motion detection, video pattern matching and auto tracking.

### THE 24/7 DATA GOLDMINE.

Today, the security departments deploy more and more surveillance cameras to watch the broader area closely 24 hours 7 days a week. IP technology enables to build the open, reliable and scalable surveillance system. While the video data is increasing, a person can watch a limited amount of video data. It is common knowledge that persons lose their concentration in a short time and suspicious movements on the screen are frequently overlooked. Intelligent Video works 24 hours a day without stopping and improves the accuracy and effectiveness of surveillance.

Here is another way to use Intelligent Video. It changes the video data to a gold mine for business activities. Customer's behaviors are recorded in the video and it contains valuable information for improvements of marketing effectiveness, store operation, building layout design, traffic pattern and other activities. It was hard, labor-intensive and time-consuming work to review hours of video from dozen of cameras. Intelligent Video analyzes a large amount of video data quickly.

It is clear that Intelligent Video is useful for surveillance operation and various business activities but it was expensive and complicated because it requires high-performance servers and dedicated software. Panasonic provides the cost-effective and easy-to-deploy Intelligent Video solution based on its field-proven image processing technology and network cameras equipped with high-performance processor. This paper describes the overview of Panasonic's Intelligent Video Technology.



## HOW INTELLIGENT VIDEO WORKS

Video Motion Detection (VMD) is the basic and prevalent technology in the security industry. It compares series of images in the video stream and identifies static background and moving foreground objects. It doesn't miss "motion", that is the difference between images, but it is a weakness at the same time. It detects the wind-whipping flag or the reflection of light as a moving object. These false alerts are costly because the operators have to confirm whether they are true threats or not. Panasonic Intelligent Video technology has made great progress. It extracts the information such as position, size, moving direction and staying time from the detected objects and analyzes their behaviors. Intelligent Video now has the capability to distinguish loitering from normal activities.

Another technology is a video pattern matching. While Video Motion Detection focuses on motion and does not care what it is, video pattern matching identifies the target by using its shaping characteristics. Face matching, one of video pattern matching application, focuses on the characteristics of the human face such as eyes, nose, mouth and others. It searches a face-shaped part on the captured image and identifies the person by comparison with the pictures on data base.



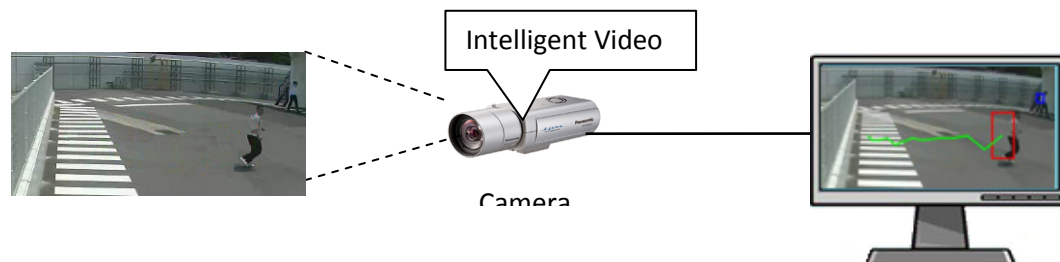
### 3 DIFFERENT SYSTEM CONFIGURATIONS

- Edge-Based Systems (Intelligent Video runs on the camera)
- Server-Based Systems (Processing is done on a central server)
- Hybrid Systems (Combine Edge-Based & Server-Based Systems)



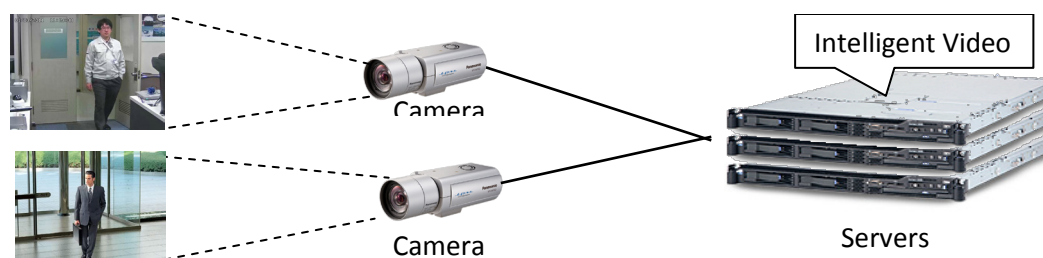
## EDGE-BASED SYSTEM

Network camera performs analyses of image and gives an alarm notification to the operators based on pre-configured alerting rules. Edge-based system doesn't require a high-performance central server and it makes system more scalable, reliable and cost-effective. Panasonic Intelligent Video Motion Detection (i-VMD), auto tracking and face detection use edge-based system configuration.



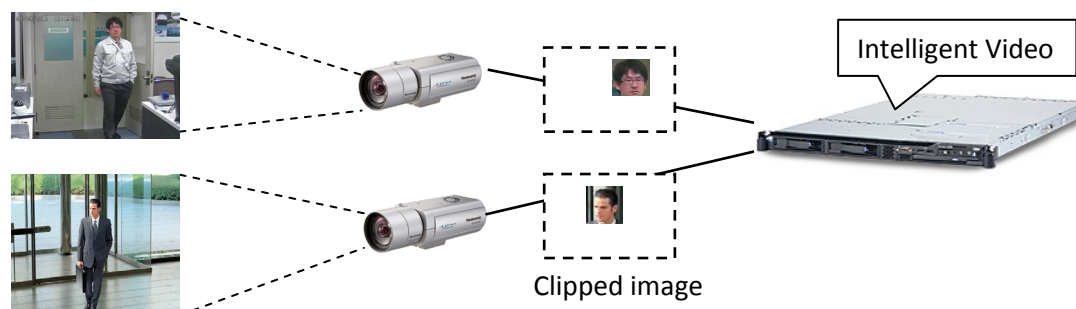
## SERVER-BASED SYSTEM

Server-based system enables more complex analyses. All images captured by cameras are sent to the central server and the server analyzes them with the stronger processing power, larger memory space, higher-speed data base access and more sophisticated software. Panasonic development partners provide various applications.



## HYBRID SYSTEM

Hybrid system combines edge-based system with server-based system and substantially reduces the overload of server and network. It enables smaller system to run Intelligent Video applications. Suppose a system which detects a person from visitors. It compares every captured image with photos on data base. What the server really needs is the facial part of the captured image. The rest wastes the resources of server and network. Hybrid system optimizes it. Cameras clip the facial part on the edge and the server just does a comparison. Panasonic face matching system uses this hybrid system configuration.



## PANASONIC'S INTELLIGENT VIDEO TECHNOLOGY

Panasonic developed UniPhier, its own high-performance chipset, in which Panasonic integrates its Audio and Video processing technology. UniPhier packs a high-performance AV processor (DSP) and a high-speed CPU onto the single chip and provides high-quality audio and video, low power consumption, real-time processing and secure features. Panasonic network cameras are equipped with UniPhier platform.

## INTELLIGENT VIDEO MOTION DETECTION (i-VMD)

Intelligent Video Motion Detection (i-VMD) is an optional feature of Panasonic 5 series outdoor and indoor network cameras. Expansion software is required.

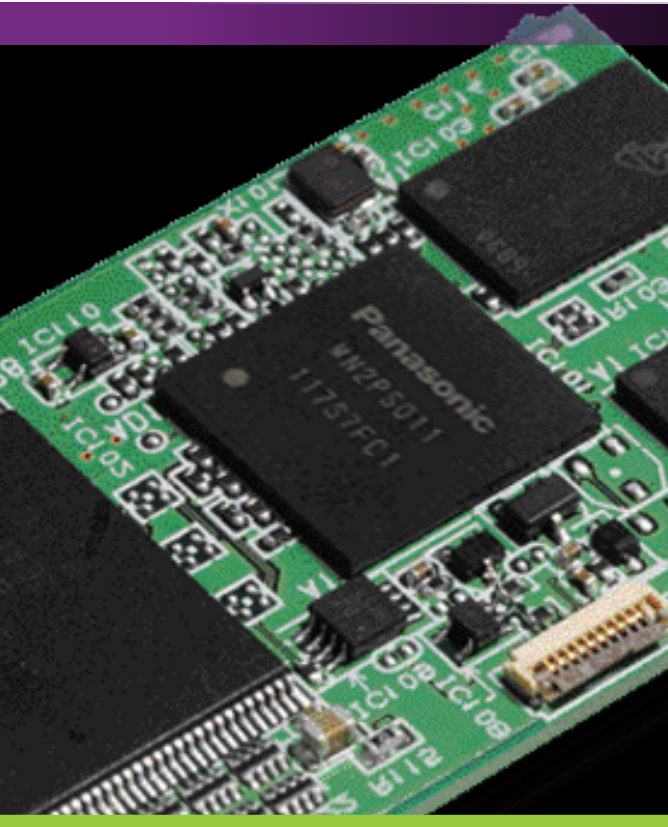
I-VMD has four Intelligent Video features of Intruder Detection, Loitering Detection, Direction Detection and Scene Change Detection. It extracts information such as position, size, moving direction and staying time from the detected moving object and analyzes its behavior. Network camera determines if it is loitering or walking normally and gives an alarm notification to the operators. High-performance UniPhier allows network cameras to detect and track up to eight moving objects simultaneously.

Configuration is also smart. Accurate definition by the polygonal detection and non-detection area, perspective target size and the schedule for operating and non-operating time, it is easy to set them through intuitive GUI.

## INTRUDER DETECTION (i-VMD)

Intruder Detection is an intelligent Video feature which detects persons or cars intruding in the restricted areas. When a network camera detects moving objects in its view, it starts tracking each of them. Once they step into a pre-configured area, the camera gives an alarm notification to the operators and highlights them with frames on the screen. It helps operators identify easily what the camera is tracking.

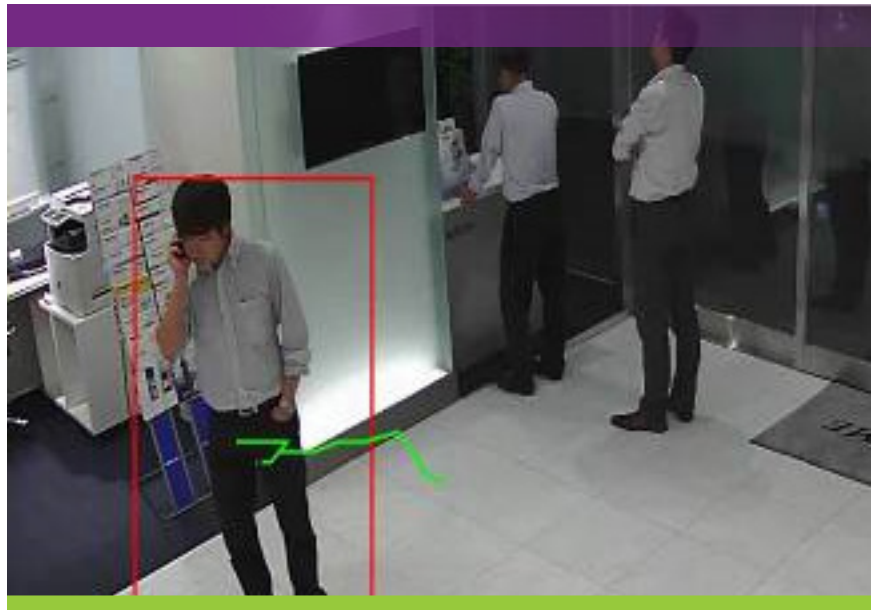
I-VMD analyzes the behavior of the moving objects so that it reduces the unwanted failure detection such as the wind-whipping flag. It decreases fault alerts with keeping high detection capability of the conventional Video Motion Detection (VMD) technology.





## LOITERING DETECTION (i-VMD)

Loitering Detection is an intelligent Video feature which detects persons who are loitering in front of the camera. When a network camera detects human-sized moving objects in pre-configured area, the camera starts tracking each of them. When they loiter there for a certain period of time, the camera gives an alarm notification to the operators and highlights them with frames. It helps the operators identify easily whom the camera is tracking.



## DIRECTION DETECTION (i-VMD)

Direction Detection is an intelligent Video feature which detects persons, cars or moving objects that go to wrong direction such as reverse run on one-way street. When a network camera detects a moving object in its view, the camera starts tracking their movement and estimates their directions to which they are going. When they are moving to unauthorized direction, the camera gives an alarm notification to the operators and highlights them with frames. It helps the operators identify easily what the camera is tracking.



## SCENE CHANGE DETECTION (i-VMD)

Scene Change Detection is an intelligent Video feature which detects tampering with the camera view. When it detects interference or tampering such as spraying on the camera dome, changing the direction of camera or covering with a cloth, it gives an alarm notification to the operators.

Persons hardly pay attention to motionless pictures. Once missed, it would take long time before an operator becomes aware of it. Scene Change Detection finds tampering immediately.



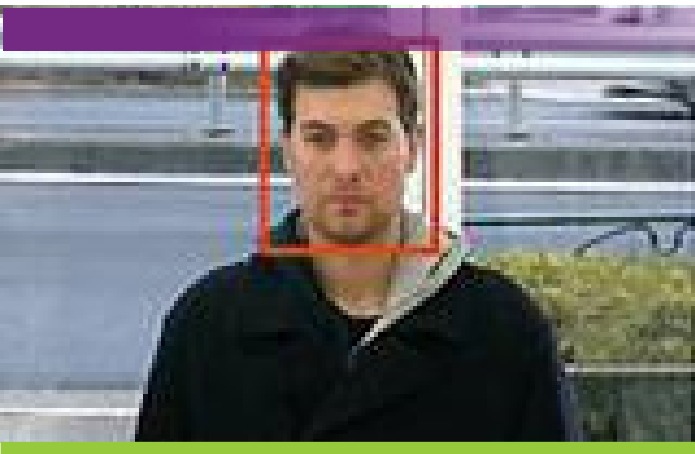
## ADVANCED AUTO TRACKING

Advanced Auto Tracking and Auto Tracking are optional features of Panasonic 5 and 3 series outdoor and indoor network cameras.

Advanced Auto Tracking and Auto Tracking are Intelligent Video features combined with the conventional video motion detection and PTZ control. When a network camera finds a moving object in its view, the camera starts panning, tilting and zooming automatically and keeps it displayed in the center of the monitor screen. Non-zoom camera supports Auto Tracking that tracks the target without zoom.

The network camera tracks the moving object until the target passes from its view. When the target goes out of its view, another camera takes over its tracking by using Panasonic proprietary inter-camera protocol.

The next generation UniPhier® Camera Platform is the heart of Panasonic's new premium 6 Series and standard 3 Series camera lines. The powerful UniPhier platform delivers sharp and natural color images needed for accurate analytics.



## FACE DETECTION

Face detection is an optional feature of Panasonic 5 and 3 series outdoor and indoor network cameras. Expansion software is required to use it.

Face detection is an Intelligent Video feature that searches a face-shaped part from the captured image in real time and highlights it with a frame. It is useful to watch those who come and go. It is also used with face matching system.

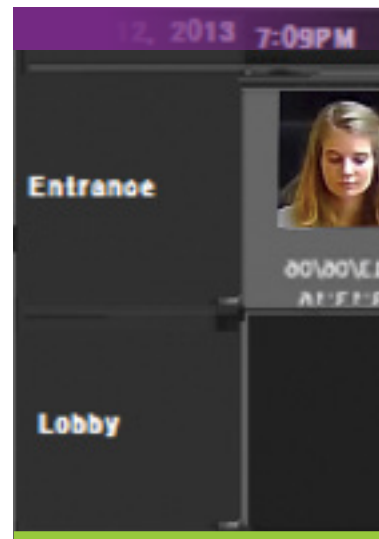
## FACE MATCHING SYSTEM

Panasonic face matching system is a cost-effective and flexible hybrid Intelligent Video system. It is available with Panasonic 3 series outdoor and indoor network cameras and WV-ASF900 face matching server or WJ-V200 network disk recorder. WV-ASF900 is suitable from small to large installation and NJ-NV200 is for small system.

WV-ASF900 face matching system receives the clipped face images from hundreds of network cameras, extracts face characteristics and compares them with the target's face photos on the data base. When it finds a similar person to the target, it gives an alarm notification to the operators. Face search of WV-ASF900 allows the operator to grasp quickly where they passed and what they did there. The operator can trace them at a glance on the history table which shows when and where they were captured by cameras. History works with video recorder and it provides easy playback operation.

It is also useful to measure and improve marketing activities. WV-ASF900 face matching system estimates age and gender of visitors from the captured face images. Combining it with sales data on Point-of-Sales (POS) selling system, it becomes possible to get more understanding of the correlative relation between customer's behavior and marketing activities.

WJ-NV200 network disk recorder is an all-in-one solution for small system. It supports up to 24 units of camera. It allows one out of 24 cameras to perform face matching analysis. Expansion software is required to use it.



# CONSIDERATIONS FOR YOUR i-VMD DEPLOYMENT

Server-less edge-based i-VMD allows you to introduce Intelligent Video system easily at an affordable cost. It is important to install the cameras adequately so that you get a better detection and lower failure rate. This section describes the steps to deploy and run Panasonic i-VMD well.

## (1) CLEAR REQUIREMENTS

Purpose, targets, zones, operating time and environmental restrictions should be clarified at the planning stage. Based on these requirements, design the system with proper cameras and options.

## (2) ON-SITE SURVEY

Detection rate is affected by various factors such as the captured size of target, shooting angle, light, weather and the background. It is recommended to do an on-site survey to confirm if the cameras detect targets as planned. If necessary, the design and/or settings should be revised.

## (3) INSTALLATION

Good performance of detection needs clear inputs. Cameras should be securely installed. Poor mounting and other installation issues negatively affect image quality through vibration and/or swing from the pole, the wall and the ground. Once Panasonic PTZ cameras are securely set, adjustment can be done from central office without dispatching workers

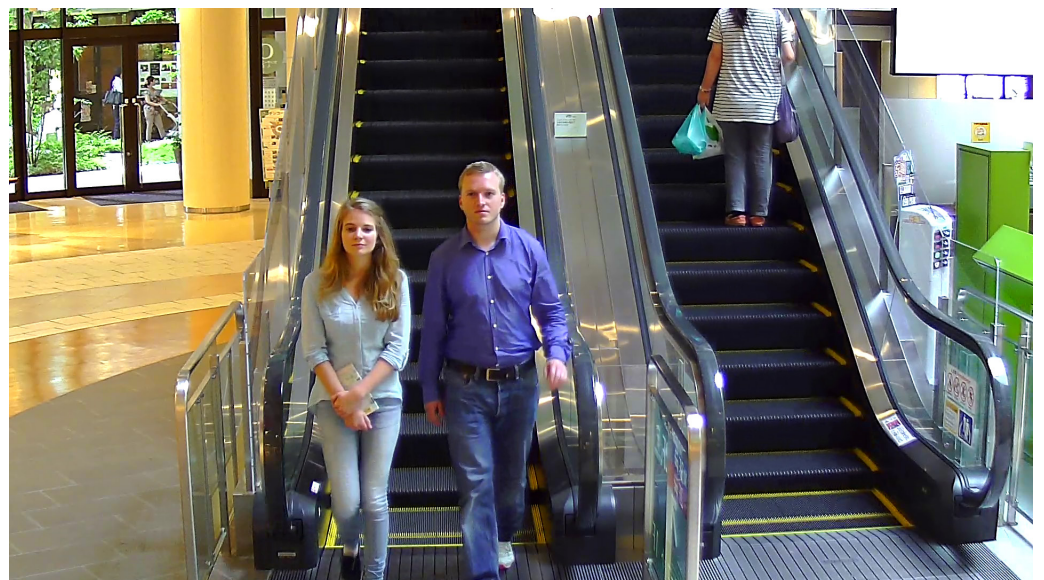
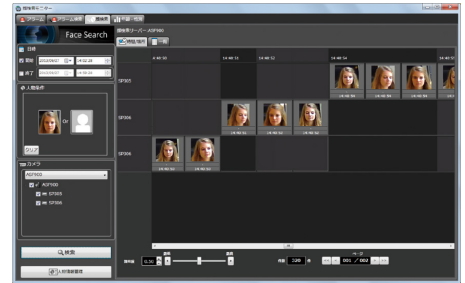
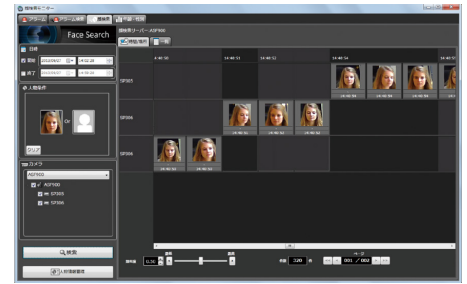
## (4) MAINTENANCE

Improper maintenance sometimes increases failure detection. The change in environment with the passing of seasons may affect the performance of detection. Proper maintenance keeps i-VMD efficient.

[panasonic.com/security](https://panasonic.com/security)



SW316L (720P)



## Your Full-Service Partner in Surveillance

Transforming surveillance system solutions from concept to completion requires the utmost attention to detail throughout every phase of the process. You can trust Panasonic to be your single-source provider for all your facility's needs, from system design to installation to post-implementation support. Offering seamless integration, superior cost efficiency and increased ROI, we will configure your surveillance system to best fit your requirements and budget, while offering a fully integrated solution with the best third-party partners in the business. Plus, Panasonic's product warranty and service network ensure your system will continually perform to your highest expectations for years to follow.

## Panasonic Solutions for Business

Panasonic delivers reliable business technology solutions that connect data with decision makers to drive better outcomes—for our customers and our customers' customers. Panasonic engineers reliable products and solutions that help create, capture and deliver data of all types, where, when and how it is needed. The complete suite of Panasonic professional solutions for government and commercial enterprises of all sizes addresses unified business communications, mobile computing, security and surveillance, retail point of sale, office productivity, visual communications (projectors, displays, digital signage) and HD video production. Panasonic solutions for business are delivered by Panasonic System Communications Company of North America, Division of Panasonic Corporation of North America, the principal North American subsidiary of Panasonic Corporation.

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