

Bi-spectrum AI Thermal Camera

Accurate object detection through high resolution video and metadata analytics



TNM-C4960TD/4950TD/4940TD

Bi-spectrum AI Thermal Camera

- Bi-spectrum multi-channel: VGA thermal & 8MP visible sensor
- Metadata sharing between two channels for object detection & video analytics
- 3 lens options: C4960TD: 25mm fixed thermal & 10.9~29mm motorised varifocal visible
C4950TD: 13.5mm fixed thermal & 10.9~29mm motorised varifocal visible
C4940TD: 9.1mm fixed thermal & 4.4~9.3mm motorised varifocal visible
- AI-based video analytics
- Operating temperature: $-40^{\circ}\text{C} \sim +60^{\circ}\text{C}$ ($-40^{\circ}\text{F} \sim +140^{\circ}\text{F}$)
- Wall & pole mount all-in-one design

Reducing false alarm based on AI

The cameras feature highly accurate deep-learning-based object detection and classification. AI-based object detection reduces the occurrence of false alarms, providing operators with a reliable source of events, while accurate object classification improves operational efficiency by making forensic search highly efficient. The cameras can detect human faces, as well as identify particular vehicles and number plates while ignoring irrelevant motion such as wind-blown trees, shadows, stray objects, or animals moving within the field of view.



VGA Thermal image
3 fixed focal lens option
HFOV : 17.4° / 31.9° / 50°

Rapid object detection through simultaneous monitoring of thermal camera and visible sensor

Metadata sharing between two channels

The thermal lens enables perimeter detection of suspicious activity even in low light, poor weather conditions, or when visual barriers, such as foliage block the field of view. The visual lens provides identification detail, thereby determining if the suspicious activity is, for example, an intruder. This enables detection and rapid identification without having to install two separate devices - saving time, equipment and ongoing maintenance costs and reducing the total cost of ownership.

While both the thermal and visible channels feature accurate AI-based object detection and classification, the thermal channel is more likely to detect an object in challenging light conditions and the ability to share metadata allows operators to get a fuller picture of the situation.



Visible sensor

Thermal camera

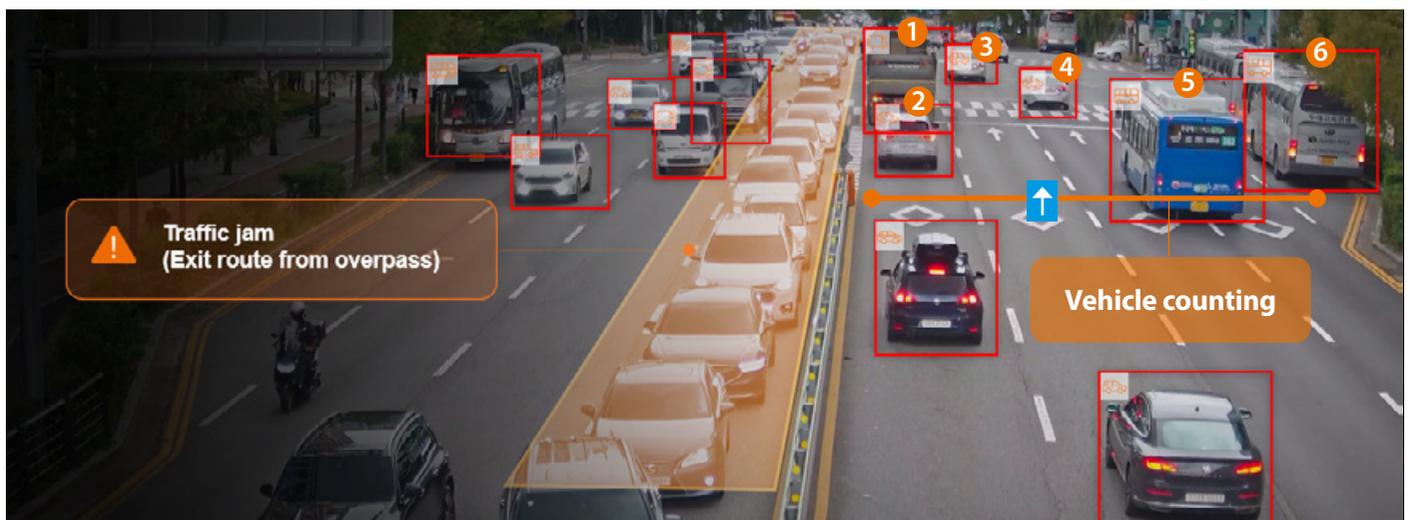
Optimised analytics for road/traffic detection

The bi-spectrum AI cameras are ideal for traffic monitoring with accurate AI-based object detection and classification including Person, Vehicle (car/truck/bus/bicycle/motorcycle) and Licence Plate.

Intelligent traffic video analytics on-board the cameras include stopped vehicle, wrong direction and traffic jam detection and vehicle counting.



Stopped vehicle detection



Traffic jam detection and vehicle counting

Key Specification

Thermal



Model	TNM-C4960TD	TNM-C4950TD	TNM-C4940TD
Video			
Imaging Device	Uncooled micro bolometer		
Resolution	1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360		
Max. Framerate	H.265/H.264: Max. 30fps MJPEG: Max. 3fps		
NETD	<60mK		
Pixel Size	12µm		
Min. Illumination	None		
Video Out	USB : Micro USB Type B, 1280x720 for installation		
Lens			
Focal Length (Zoom Ratio)	25mm fixed focal	13.5mm fixed focal	9.1mm fixed focal
Max. Aperture Ratio	F1.0		
Angular Field of View	H: 17.4 ° , V: 13.1 ° , D: 21.6 °	H: 31.9 ° , V: 24.2 ° , D: 39.5 °	H: 50.0 ° , V: 37.0 ° , D: 63.8 °
Min. Object Distance	26m	7.6m(24.93ft)	3.5m(11.48ft)
Focus Control	Fixed		
Operational			
Camera Title	Displayed up to 85 characters		
Day & Night	None		
Backlight Compensation	None		
Wide Dynamic Range	None		
Digital Noise Reduction	None		
Digital Image Stabilization	None		
Motion Detection	8ea, polygonal zones		
Privacy Masking	6ea, rectangle zones – Colour: Gray/Black/White		
Gain Control	None		
White Balance	None		
LDC	None		
Electronic Shutter Speed	None		
Analytics	– Analytics events based on AI engine(NPU) : Object detection (Person/Vehicle, Bestshot, IVA (Virtual line/Area, Enter/Exit, Loitering, Direction, Intrusion), Stopped vehicle, Traffic jam – Analytics events : Motion detection		
Business Intelligence	Vehicle Counting		
Alarm I/O	4 configurable I/O ports		
Alarm Triggers	Analytics, Network disconnect, Alarm input		
Alarm Events	When alarm trigger occurred – File upload(image) : e-mail/FTP – Notification : e-mail – Recording : SD/SDHC/SDXC or NAS recording at event triggers – Alarm output – Handover(PTZ preset, Send message by HTTP/HTTPS/TCP) – Audio clip playback		
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm		

Bi-spectrum AI Thermal Camera

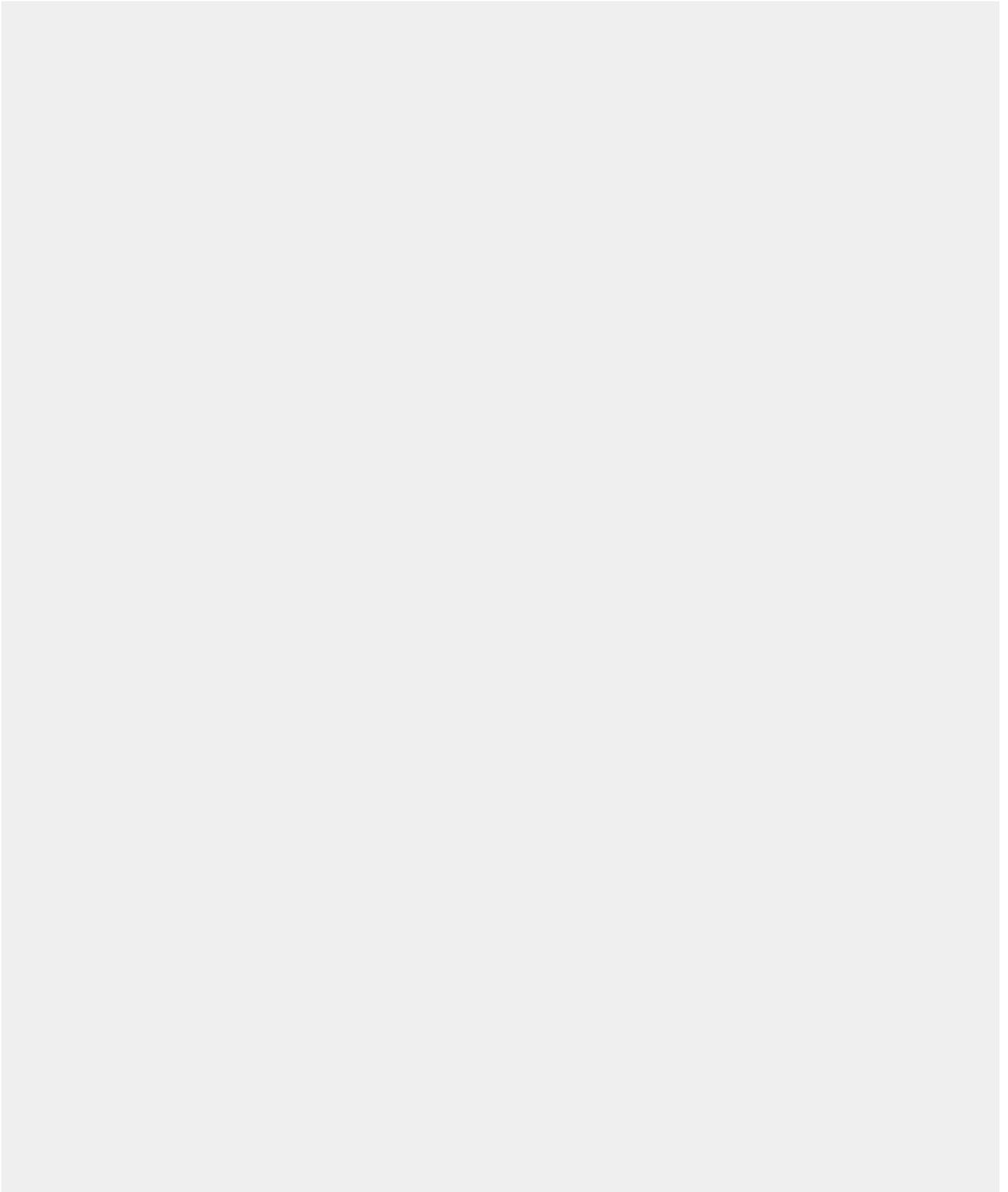
Visible

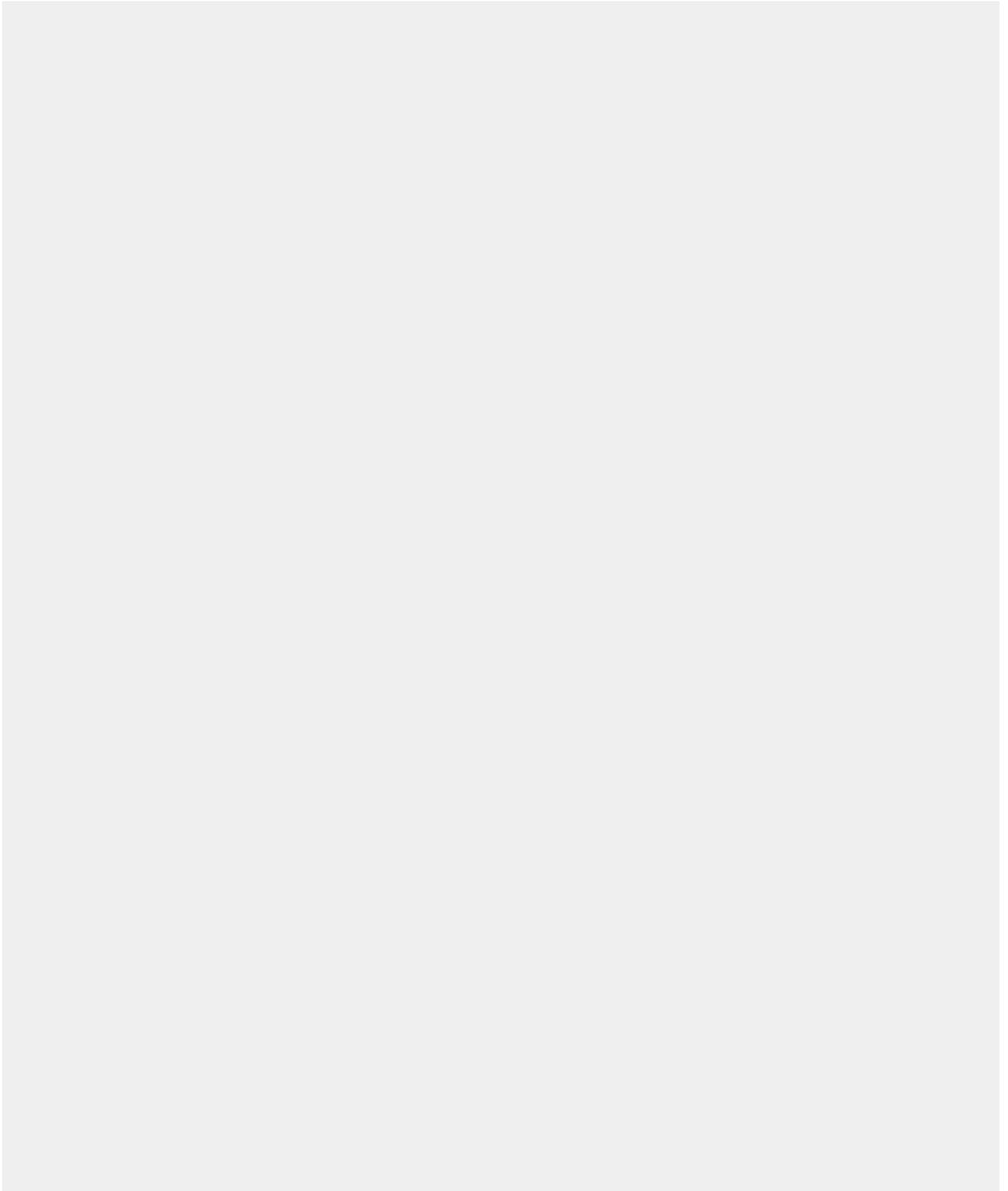


Model	TNM-C4960TD	TNM-C4950TD	TNM-C4940TD
Video			
Imaging Device	1/1.8" CMOS		
Resolution	3840x2160, 3072x1728, 2592x1944, 2688x1520, 2560x1440, 2048x1536, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360		
Max. Framerate	H.265/H.264: Max. 30fps/25fps(60Hz/50Hz) MJPEG: Max. 1fps/1fps(60Hz/50Hz)		
NETD	None		
Pixel Size	None		
Min. Illumination	Colour: 0.06Lux(F1.7, 1/30sec), BW: 0.005Lux(F1.7, 1/30sec)	Colour: 0.06Lux(F1.3, 1/30sec) BW: 0.004Lux(F1.3, 1/30sec), 0Lux(IR LED on)	
Video Out	USB : Micro USB Type B, 1280x720 for installation		
Lens			
Focal Length (Zoom Ratio)	10.9~29mm(2.6x) motorized varifocal	4.4~9.3mm(2.2x) motorized varifocal	
Max. Aperture Ratio	F1.7(Wide)~F1.73(Tele)	F1.3(Wide)~F2.15(Tele)	
Angular Field of View	H:42.0° (Wide)~15.0° (Tele) / V:22.8° (Wide)~8.4° (Tele) / D:48.7° (Wide)~17.1° (Tele)	H:112.1° (Wide)~47.5° (Tele) / V:58.0° (Wide)~26.6° (Tele) / D:137.5° (Wide)~54.6° (Tele)	
Min. Object Distance	Wide: 2.5m(8.20ft) / Tele: 6m(19.68ft)	Wide: 1.75m(5.74ft) / Tele: 5.21m(17.09ft)	
Focus Control	Simple focus		
Operational			
Camera Title	Displayed up to 85 characters		
Day & Night	Auto(ICR)		
Backlight Compensation	BLC, WDR, SDDR		
Wide Dynamic Range	WDR(120dB)		
Digital Noise Reduction	SSNR V, WiseNR II		
Digital Image Stabilization	Support(built-in gyro sensor)		
Motion Detection	8ea, polygonal zones		
Privacy Masking	6ea, rectangle zones – Colour: Gray/Black/White		
Gain Control	Low / Middle / High		
White Balance	ATW / AWC / Manual / Indoor / Outdoor		
LDC	Support		
Electronic Shutter Speed	Minimum / Maximum / Anti flicker(1/5~1/12,000sec) Auto prefer shutter control(Based on AI engine)		
Analytics	– Analytics events based on AI engine(NPU) : Object detection (Person/Face/Vehicle(car/truck/bus/bicycle/motorcycle)/License plate), Bestshot, IVA (Virtual line/Area, Enter/Exit, Loitering, direction, intrusion), Stopped vehicle, Traffic jam – Analytics events : Defocus detection, Motion detection, Tampering, Audio detection, Sound classification, Shock detection, Appear/Disappear		
Business Intelligence	Vehicle Counting		
Alarm I/O	4 configurable I/O ports		
Alarm Triggers	Analytics, Network disconnect, Alarm input		
Alarm Events	When alarm trigger occurred – File upload(image) : e-mail/FTP – Notification : e-mail – Recording : SD/SDHC/SDXC or NAS recording at event triggers – Alarm output – Handover(PTZ preset, Send message by HTTP/HTTPS/TCP) – Audio clip playback		
Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm		



Memo





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