VIVOTEK

S series
TB9331-E
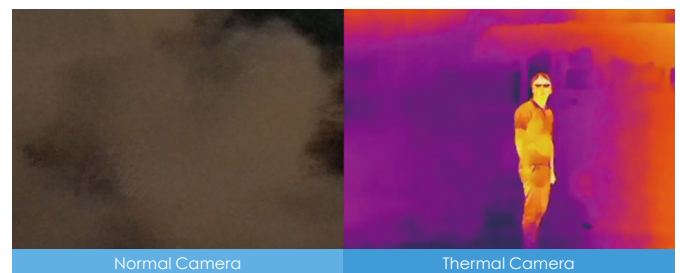## Thermal Bullet Network Camera

720x480 • NETD < 50 mk • H.265 • Trend Micro IoT Security • -50°C ~ 60°C • IP66/67 • IK10 • NEMA 4X

VIVOTEK's TB9331-E is an H.265 outdoor thermal bullet network camera designed to detect people and vehicles in wild weather, difficult lighting conditions, and any situation that create poor visibility. With heat based thermal imagery and lens options of 8.8/19/35/50mm, the TB9331-E supports long distance monitoring of vehicles up to 4,500m away even in complete darkness or under challenging climate conditions such as fog, rain, smoke and dust.

The TB9331-E offers 720x480 resolution with an uncooled thermal sensor and VIVOTEK's VCA (Video Content Analysis) to enhance perimeter protection and boarder security. This camera is also embedded with Trend Micro IoT Security software to provide users with higher levels of network protection. With an IP66, IP67, IK10 and NEMA 4X-rated rugged design, the TB9331-E will withstand shock &vibration, humidity, dust, and even extreme temperature fluctuations to maintain stable and reliable video no matter how harsh the environment.

Key Features

- Uncooled VOx Infrared Detector
- 720x480 Resolution
- NETD < 50 mk @ F1.0
- H.265 Compression Technology
- Trend Micro IoT Security
- Two-way Audio
- Supports ONVIF Standard to Simplify Integration and Enhance Interoperability
- UL Certification
- Weather-proof IP66/IP67, Vandal-proof IK10 and NEMA 4X-rated Housing
- VIVOTEK VCA (Video Content Analysis) Support

| Normal Camera | Thermal Camera |

Infrared thermal image through fog and smoke.

Technical Specifications

Model	TB9331-E(8.8mm) TB9331-E(19mm) TB9331-E(35mm) TB9331-E(50mm)

System Information

CPU	Multimedia SoC (System-on-Chip)
Flash	128 MB
RAM	512 MB

Camera Features

Image Sensor	Uncooled VOx infrared detector
Maximum Resolution	Effective pixels: 720x480 Image scale up to: 960x640
Pixel Size	17 µm
Spectral Range	8 ~ 14 µm
Sensitivity	NETD < 50 mk
Lens Type	Fixed-focal (Thermal lens)
Focal Length	TB9331-E(8.8mm): f = 8.8 mm TB9331-E(19mm): f = 19 mm TB9331-E(35mm): f = 35 mm TB9331-E(50mm): f = 50 mm
Aperture	F1.0
Auto-iris	Fixed iris
Field of View	TB9331-E(8.8mm): 69.6° (Horizontal) 49.7° (Vertical) 79.8° (Diagonal) TB9331-E(19mm): 35.7° (Horizontal) 24.2° (Vertical) 42.3° (Diagonal) TB9331-E(35mm): 19.8° (Horizontal) 13.3° (Vertical) 23.7° (Diagonal) TB9331-E(50mm): 14° (Horizontal) 9.3° (Vertical) 16.7° (Diagonal)
Pan/Tilt/Zoom Functionalities	ePTZ: 20x digital zoom (4x on IE plug-in, 5x built-in)
Storage	Seamless Recording to MicroSD/SDHC/SDXC card and recording to network-attached storage (NAS)

Video

Compression	H.265, H.264, MJPEG
Maximum Frame Rate	30 fps @ 720x480
Maximum Streams	4 simultaneous streams
Video Streaming	Adjustable resolution, quality and constant bit rate control, Smart Stream II

Image Settings	General settings: video title and time stamp overlay, video orientation (flip, mirror, rotation); Thermal settings: white balance, image adjustment (brightness, contrast, sharpness); Privacy mask; Scheduled profile settings

Audio

Audio Capability	Two-way audio (full deuplex)
Compression	G.726, G.711
Interface	External microphone input External line output

Network

Users	Live viewing for up to 10 clients
Security	Access list, digest authentication, HTTPS, IEEE 802.1x, Password protection,user access log, user account management
Protocols	802.1X, ARP, Bonjour, CIFS/SMB, DDNS, DHCP, DNS, FTP, HTTP, HTTPS, ICMP, IGMP, IPv4, IPv6, NTP, PPPoE, QoS (CoS/DSCP), RTSP/RTP/RTCP, SMTP, SNMP, SSL, TCP/IP, TLS, UDP, UPnP
Interface	10 Base-T/100 Base-TX ethernet (RJ-45) *It is highly recommended to use standard CAT5e & CAT6 cables which are compliant with the 3P/ETL standard.
ONVIF	Profile G, S supported, specification available at www.onvif.org

Intelligent Video

Video Motion Detection	Five-window video motion detection, human detection, time filter
VCA	Line crossing detection, field detection, loitering detection
VADP Package	Trend Micro IoT Security (3-year free trial)

Alarm and Event

Event Trigger	Audio detection, camera tampering detection, cybersecurity events (brute force attack event, cyberattack event, quarantine event), digital input, manual trigger, motion detection, periodical trigger, recording notification, SD card life expectancy, shock detection, system boot
Event Action	Event notification via audio clip, digital output, email, HTTP, FTP, NAS server, SD card File upload via email, HTTP, FTP, NAS server, SD card

General

Connectors	RJ-45 cable connector for 10/100 Mpbs Network/PoE connection Audio input Audio output DC 12V power input AC 24V power input Digital input Digital output (DO+: 12V, 50mA; DO-: 30V, Open Drain, 1A) BNC RS485

Technical Specifications

LED Indicator	System power and status indicator
Power Input	AC 24V, DC 12V, IEEE 802.3at PoE Class 4 (Simultaneous Power Redundancy Supported)
Power Consumption	PoE: Max. 14 W DC 12V: Max. 11 W AC 24V: Max. 12.4 W
Dimensions	TB9331-E(8.8mm): 121 x 121 x 471.2 mm (with junction box) TB9331-E(19mm): 121 x 121 x 452.2 mm (with junction box) TB9331-E(35mm)/(50mm): 121 x 121 x 455.6 mm (with junction box)
Weight	TB9331-E(8.8mm)/(35mm)/(50mm): 2,115 g TB9331-E(19mm): 2,050 g
Operating Temperature	Start Temperature: -40°C ~ 60°C (-40°F ~ 140°F) Working temperature: -50°C ~ 60°C (-58°F ~ 140°F)
Humidity	90%

System Requirements

Operating System	Microsoft Windows 10/8/7 Mac 10.12 (Chrome only)
Web Browser	Chrome 58.0 or above Internet Explorer 10/11

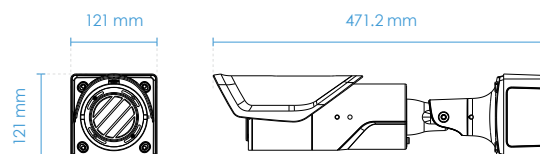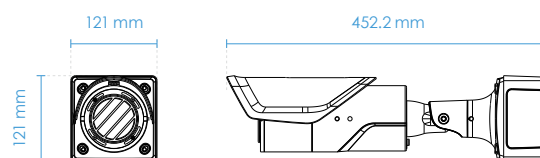|	
Other Players	VLC: 1.1.11 or above

Included Accessories

Others	Quick installation guide, alignment sticker, screw pack, waterproof accessory bag, junction box, sunshield

Dimensions

• **TB9331-E(8.8mm)**
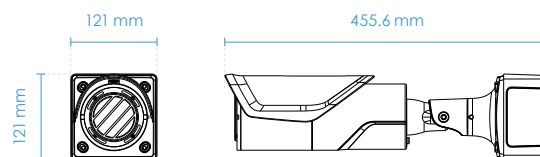
121 mm   471.2 mm

121 mm

• **TB9331-E(19mm)**

121 mm   452.2 mm

121 mm

• **TB9331-E(35mm)/(50mm)**

121 mm   455.6 mm

121 mm

Compatible Accessories

Mounting Kits		
AM-312 Pole Mount Adapter	AM-412 Corner Mount Adapter	AM-719 Junction Box (Standard Package)

Coverage Table

Detection Ranges

Resolution		720x480			
Focal Length		8.8 mm	19 mm	35 mm	50 mm
FOV	Horizontal	69.6°	35.7°	19.8°	14°
	Vertical	49.7°	24.2°	13.3°	9.3°
Human 1.8 x 0.5 m (5 x 1 ft)	Detection (1.5 pixels)	262 m (859 ft)	566 m (1,856 ft)	1,043 m (3,422 ft)	1,490 m (4,888 ft)
	Recognition (6 pixels)	66 m (216 ft)	142 m (465 ft)	261 m (856 ft)	373 m (1,223 ft)
	Identification (12 pixels)	33 m (108 ft)	71 m (232 ft)	130 m (426 ft)	186 m (610 ft)
Vehicle 4 x 1.5 m (13 x 4 ft)	Detection (1.5 pixels)	801 m (2,627 ft)	1,729 m (5,672 ft)	3,184 m (10,446 ft)	4,549 m (14,924 ft)
	Recognition (6 pixels)	200 m (656 ft)	432 m (1,416 ft)	796 m (2,611 ft)	1,137 m (3,730 ft)
	Identification (12 pixels)	100 m (328 ft)	216 m (708 ft)	398 m (1,305 ft)	569 m (1,866 ft)

Note: The detection ranges are calculated using Johnson's criteria and may vary under different environmental variables.

Standard VCA Ranges

Resolution	720x480			
Focal Length	8.8 mm	19 mm	35 mm	50 mm
Human 1.8 x 0.5 m (5 x 1 ft)	33 m (108 ft)	71 m (232 ft)	130 m (426 ft)	186 m (610 ft)
Vehicle 4 x 1.5 m (13 x 4 ft)	100 m (328ft)	216 m (708 ft)	398 m (1,305 ft)	569 m (1,866 ft)

Note: The detection ranges are the theoretical values and may vary under different environmental variables.