

MIC IP fusion 9000i

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Invented for life



- u Ruggedized IP PTZ camera with high performance thermal imager and HD visible imager sitting side-by-side
- u Designed to provide the highest availability of useable images regardless of lighting conditions in extreme environments (weather, dust/debris/smoke, etc.)
- u Unique metadata fusion feature provides the ultimate in situation awareness
- u Exceptional early detection capabilities: Object detection up to 4517 m (14,820 ft) based on DRI criteria
- u Advanced on-board intelligent video tracking, object detection even when camera is on tours

The MIC IP fusion 9000i camera is an advanced PTZ surveillance platform designed to provide early detection in mission-critical applications. With its dual visible/thermal imaging capabilities, the MIC IP fusion 9000i camera is the perfect solution for robust and high-quality imaging needs.

The camera's distinctive, ruggedized design is well-suited for extreme environments and adverse weather conditions such as high winds, rain, fog, ice, and snow.

Precision engineered using Bosch's domain expertise in material and mechanical engineering, the camera offers the most advanced imaging and positioning system solution available on the market.

Functions

Exceptional imaging performance

The MIC IP fusion 9000i camera incorporates a high-performance thermal imaging core and a 1080p starlight camera integrated in the same housing. This

allows the camera to deliver simultaneous thermal and visible video streams, maximizing the ability to detect and react to long-range threats.

Thermal imager

The thermal imager incorporates the latest un-cooled vanadium oxide microbolometer technology. This high sensitivity thermal imager is equipped with a fixed focal length Athermal lens that balances the field-of-view with maximizing the detection distance. User-adjustable settings for contrast and gain allow operators to optimize the image, ensuring delivery of the highest quality video. In addition, a wide variety of user-selectable thermal color modes are available allowing further optimization of the thermal image. Depending on model mix, QVGA resolution (320 pixels) and VGA resolution (640 pixels) versions are available, with choice of low (<9Hz) or high (30/60Hz) frame rates.

Visible imager

The 1080p60-capable visible imager has starlight technology and a 30x optical/12x digital zoom lens that provides high-quality images, excellent color performance, and unbeatable low-light sensitivity. High dynamic range ensures clear image reproduction in the most challenging high-contrast scenes.

Ruggedized design for extreme applications

The MIC IP fusion 9000i camera is designed for surveillance applications beyond the mechanical capabilities of normal PTZ domes or conventional positioning systems.

- **Ingress**

The camera is environmentally sealed and complies with Type 6P and IP68 standards, when attached to a MIC-DCA or a MIC-WMB. This level of protection eliminates any risk of dust or water ingress, making the camera a perfect choice for use in extreme environments with rain, dust, snow, flying debris, and other challenging conditions.

In addition, the MIC camera's ingress protection method does not need periodic maintenance, which is required on cameras with pressurized housings.

- **Wide operating temperature range**

The camera's operating temperature range of -40 °C to +65 °C (-40 °F to +149 °F) enables reliable surveillance monitoring in global locations from cold northern latitudes to hot equatorial and desert regions.

- **Rugged construction**

The all-metal body has been engineered to withstand IK10-level impacts, and continuous low-frequency vibration. With its symmetrical, cross-section designed surfaces, the camera is also well-suited to operating in sites with high wind conditions.

- **Excellent corrosion protection**

The camera benefits from Bosch Automotive domain knowledge in material engineering and coatings. As a result, the superior metallurgy, chromate based pre-coating, and paint finish of the camera provides unprecedented protection against corrosion.

Reliability is ensured by the camera's ability to withstand a 2000-hour salt atmosphere at elevated temperature corrosion resistance test, according to the ASTM B117 test method.

- **Window Wiper and Defroster**

The camera features a highly durable, silicone wiper which removes moisture from both the glass and germanium windows. In addition, both windows incorporate embedded defrosters that minimize build-up of snow and ice, ensuring the highest-possible image details in extreme cold and moist conditions.

The wiper can also be integrated with third-party washer systems for regular cleaning and maintenance activities.

Intelligent Video Analytics on the edge

The camera includes the latest release of Intelligent Video Analytics for monitoring both the visible and the thermal image streams.

Designed for mission-critical applications, the video analytics can reliably detect, track, and analyze moving objects while suppressing unwanted alarms from spurious sources in the image, even in harsh weather conditions.

Advanced tasks like multiple line crossing, loitering, idle / removed object detection, crowd density estimation, occupancy and people counting are available for live alarming and forensic search. Object filters based on size, speed, direction, aspect ratio, and color can be defined.

Set-up time is minimized because only the installation height of the camera must be entered to calibrate the analytics.

After the camera is calibrated, the analytics engine can automatically classify objects as upright person, car, bike, or truck.

Video analytics while camera is moving

The Intelligent Video Analytics can trigger an alarm when the visible imager detects objects in motion in alarm fields while the camera is moving.

These alarm fields are defined once across all PTZ camera views. Any part of those fields that is currently within the camera's view becomes active. Thus, guard tours sweeping across the monitored areas in order to provide an intruder less time to slip by can now automatically alarm on those intruders as well.

If desired, the alarm can even be used to trigger the camera's Intelligent Tracking feature.

Metadata Fusion imaging

The metadata fusion feature enables operators to receive notification of detected events from both thermal and visible image streams, regardless of which image stream they are viewing. This gives operators a much higher level of situational awareness, and eliminates the need to monitor both visible and thermal images constantly.

For example, a standard camera viewing a scene with limited visibility produces an image such as the one below.



The same scene viewed using the visible imager of the MIC IP fusion 9000i camera would include metadata fusion events detected by the thermal imager, as shown below.



Once alerted, operators can switch to the thermal image (below) of the scene, where they can easily see the objects creating the alarm. Hence, the metadata fusion feature provides enhanced situational awareness.



Intelligent Tracking

The newest generation of the Intelligent Tracking feature ensures smoother camera motion for more comfortable viewing and more reliably tracking objects even under challenging scenes.

On the visible imager, when Intelligent Video Analytics application detects objects or individuals, the camera can automatically activate the Intelligent Tracking feature, which controls the pan/tilt/zoom actions of the camera in order to track objects and keep them in view.

Areas with potentially interfering background motion (moving trees, pulsating lights, and busy roads) can be masked out.

The camera supports 2 Intelligent Tracking modes:

- **Auto mode:** In this mode, the camera follows any object that has triggered an alarm in the Intelligent Video Analytics application. This mode is most useful for scenarios where the alarm cases can be clearly defined, for example, when no motion is expected at all.

- **Click mode:** In this mode, users can click on any object detected by the Intelligent Video Analytics application to enable the camera to track the movement of the selected object. This mode is most useful for scenarios where normal scene activity is expected.

H.265 Video encoding

The camera is designed on the most efficient and powerful H.264 and H.265/HEVC encoding platform. The camera is capable to deliver high-quality and high-resolution video with very low network load. With a doubling of encoding efficiency, H.265 is the new compression standard of choice for IP video surveillance systems.

Intelligent streaming

Smart encoding capabilities, together with Intelligent Dynamic Noise Reduction technology and analytics, make the bandwidth consumption drop to extremely low levels. Only relevant information in the scene, such as motion or objects found with the analytics, are encoded.

The camera is capable of providing 4 streams of thermal video and 4 streams of HD visible video simultaneously (8 streams total). This allows the camera to deliver independent, configurable streams for live viewing, recording, or remote monitoring via constrained bandwidths.

Recording and storage management

The Bosch Video Recording Manager application can control recording management for the camera. Alternately, the camera can use its embedded local storage and iSCSI targets directly without any recording software.

The camera's embedded local storage (internal EMMC-based memory) can be used for recording "at the edge" or for Automatic Network Replenishment (ANR) to improve the overall recording reliability. At the worst case--full streaming conditions, comprising both visible and thermal image streams, metadata, and audio--up to 4 hours of local storage time is possible. Furthermore, pre-alarm recording is available to capture details of an incident before the alarm actually occurs.

Access and Data Security

Special measures have been put in place to ensure the highest level of security for device access and data transport. The three-level password protection with security recommendations allows users to customize device access. Web browser access can be protected using HTTPS and firmware updates are always protected with authenticated secure uploads. The on-board Trusted Platform Module (TPM) and Public Key Infrastructure (PKI) support guarantee superior protection from malicious attacks. The 802.1x network authentication with EAP/TLS, supports TLS 1.2 with updated cipher suites including AES 256 encryption.

The advanced certificate handling offers:

- Self-signed unique certificates automatically created when required
- Client and server certificates for authentication
- Client certificates for proof of authenticity
- Certificates with encrypted private keys
- Installed Bosch Escrypt certificate, which ensures that the product is produced by Bosch

System integration and ONVIF conformance

The camera conforms to the Open Network Video Interface Forum (ONVIF) Profile S and Profile G specifications. For H.265 configuration the camera also supports Media Service 2 which is part of the future ONVIF Profile T. Compliance with these standards guarantees interoperability between network video products regardless of manufacturer. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Integration Partner Program (IPP) website (ipp.boschsecurity.com) for more information.

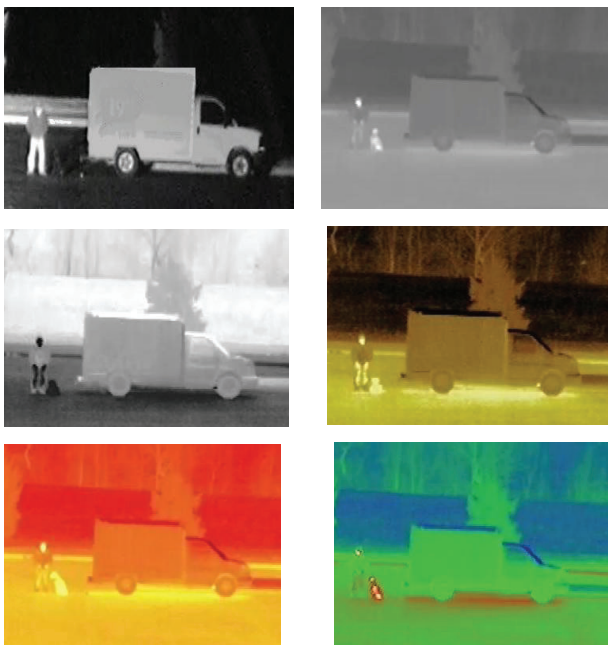
Other Features

The camera includes many advanced features that work to maximize performance and satisfy the most demanding system operation requirements.

• Scene modes

The camera has a very intuitive user interface that allows fast and easy configuration to optimize image quality.

The visible imager has five user-selectable scene modes with pre-configured settings that optimize the imaging for a variety of applications, including Motion, Low light, and Vibrant. Operators can select different scene modes for day or night situations. The thermal imager has 12 user-selectable thermal mode options, including White hot, Black hot, Red Light, Softlight, and Sunset.

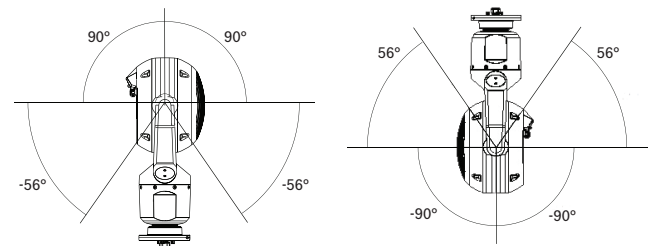


Examples of visible and thermal color modes

High performance PTZ operations

The camera has a closed-loop feedback control system using a 15-bit position resolver. This resolver ensures high accuracy coordinates are linked with every pan/tilt position. Because the camera always knows where it is pointed, it will return automatically to its original position even if moved by extremely high winds. The pan and tilt mechanism of the camera is a ruggedized, spur gear system. The brushless motors directly control the pan and tilt movement using a finely-tuned gear train designed to minimize backlash and support continuous operation without much wear and tear.

With a full 360° continuous rotation pan, 296° tilt control, and super-quick pan (120°/second) and tilt (90°/second) operational speeds, the camera outperforms other cameras in its class.



Tilt range of MIC IP fusion 9000i camera

The camera's ability to operate at very slow speeds (<0.2°/second) means it excels at tracking slow-moving objects or objects at a distance.

The camera supports 256 pre-positions and two styles of Guard Tours: Preset and Record/Playback. One preset tour has capability for up to 256 consecutive pre-positions and the other with up to 256 user-defined pre-positions. Both offer configurable dwell time between pre-positions.

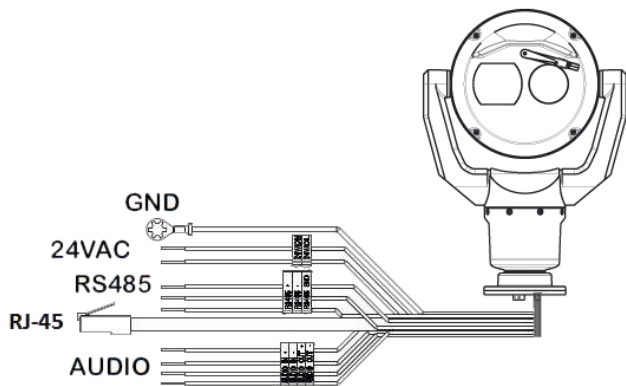
The camera also provides support for two custom recorded tours, which have a combined duration of 30 minutes of movements. The custom tours are recorded macros of an operator's movements, including pan, tilt, zoom, focus and pre-position activities. Operators can play back tours in a continuous manner.

Certifications and approvals

| Standards | Type |
|---------------|--|
| Emissions | EN 55032 class A FCC: 47 CFR Part 15 B, class A RCM: AS/NZS CISPR 32 |
| Immunity | EN 50130-4 EN 50121-4 |
| Environmental | IEC 60068-2-1 IEC 60068-2-2 IEC 60068-2-30 |

| | |
|---------------------|---|
| Safety | EN 60950-1 EN 60950-22 UL 60950-1, Ed. 2 CAN/CSA C22.2 No. 60950-1-07, Ed. 2 EN 62368-1 UL 62368-1 |
| Marks | cUL, CE, WEEE, RCM, EAC, FCC, RoHS |
| ISO Quality Systems | ISO 9001 ISO 14001 |

Installation/configuration notes



Interfaces for MIC IP fusion 9000i camera

The camera has been designed for quick and easy installation, a key feature from Bosch IP video security products.

The camera can be powered using a standard 24 VAC power source and/or by a network-compliant 95W High Power-over-Ethernet (Bosch's version of High PoE). With a 95W High PoE Midspan (NPD-9501A, sold separately) from Bosch, a single (Cat5e/Cat6e) cable connection provides everything needed to view, power, and control the camera. Using High PoE makes installation easier and more cost effective, as cameras do not require a local power source.

Easy setup is guaranteed by using Configuration Manager or the web browser built into the camera. Access to all settings, live video, and control functions is available in a user-friendly web page format.

Technical specifications

MIC IP fusion 9000i cameras are available with different housing colors, two thermal imager resolution options, and thermal frame rate options. The last three letters of the model number identify the housing color ("B" (black), "W" (white), or "G" (grey)), the resolution, and the thermal frame rate. In the table below, "x" represents the letter for the housing color.

Note: Some models are not available in all regions.

| Model | Resolution | Frame rate |
|------------------|----------------------|------------|
| MIC-9502-Z30-xQS | 320 pixel (Standard) | <9Hz |
| MIC-9502-Z30-xQF | 320 pixel (Standard) | 60Hz |
| MIC-9502-Z30-xVS | 640 pixel (High) | <9Hz |
| MIC-9502-Z30-xVF | 640 pixel (High) | 30Hz |



Notice

All thermal camera models are export-controlled by the U.S. Department of Commerce (USDoC). Depending on country of installation and application, an export license may be required. For more information, contact your local Bosch Security Systems Customer Service Center.

Additional camera models with different combinations of housing color, resolution, and frame rate may be available. If you need a model not listed in the **Ordering Information** section, contact your local Bosch representative.

Thermal camera core, standard resolution (320 pixels)

| | |
|---------------------------------------|--|
| Imager | Focal Plane Array (FPA), un-cooled Vanadium Oxide microbolometer |
| Resolution/Effective Picture Elements | 320 x 240 |
| Pixel Pitch | 17 μ m |
| Frame rate | <9Hz ("QS" models) 60Hz ("QF" models) |
| Lens | Athermal 19 mm (F1.1) |
| Field of View (FOV) | 16° x 12° |
| Spectral Response | 8 to 14 μ m |
| Thermal Sensitivity (NEDT) | <62mK (at room temperature; Noise Reduction ON) |
| Focus | Factory-set at infinity |
| Focus Distance | 14 m to ∞ (46 ft to ∞) |
| Contrast enhancement | On/Off |
| Gain Level | User-adjustable |
| Brightness Level | User-adjustable |
| Noise reduction | On/Off |
| User-selectable thermal color modes | 12 |

| Approximate Performance Range in ideal conditions based on DRI criteria** | Human 1.8 x 0.5 m (5.9 x 1.6 ft) | Object 2.3 x 2.3 m (7.5 x 7.5 ft) |
|---|----------------------------------|-----------------------------------|
| Detection | 379 m (1243 ft) | 1746 m (5728 ft) |
| Recognition | 95 m (312 ft) | 436 m (1430 ft) |
| Identification | 47 m (154 ft) | 218 m (715 ft) |

**For more information, including detection distances using video analytics, refer to the Video Analytics and Lens Calculator.

Thermal camera core, high resolution (640 pixels)

| | |
|---------------------------------------|--|
| Imager | Focal Plane Array (FPA), un-cooled Vanadium Oxide microbolometer |
| Resolution/Effective Picture Elements | 640 x 480 |
| Pixel Pitch | 17 µm |
| Frame rate | <9Hz ("VS" models) 30Hz ("VF" models) |
| Lens | Athermal 50 mm (F1.2) |
| Field of View (FOV) | 12.4° x 9.3° |
| Spectral Response | 8 to 14 µm |
| Thermal Sensitivity (NEDT) | <72mK (at room temperature; Noise Reduction ON) |
| Focus | Factory-set at infinity |
| Focus Distance | 84 m to ∞ (276 ft to ∞) |
| Contrast enhancement | On/Off |
| Gain Level | User-adjustable |
| Brightness Level | User-adjustable |
| Noise reduction | On/Off |
| User-selectable thermal color modes | 12 |

| Approximate Performance Range in ideal conditions based on DRI criteria** | Human 1.8 x 0.5 m (5.9 x 1.6 ft) | Object 2.3 x 2.3 m (7.5 x 7.5 ft) |
|---|----------------------------------|-----------------------------------|
| Detection | 982 m (3222 ft) | 4517 m (14,820 ft) |
| Recognition | 245 m (804 ft) | 1129 m (3704 ft) |
| Identification | 123 m (404 ft) | 565 m (1854 ft) |

**For more information, including detection distances using video analytics, refer to the Video Analytics and Lens Calculator.

Visible camera core

| | | |
|---|--|-------------------------|
| Imager | 1/2.8-type Exmor R CMOS sensor | |
| Effective Picture Elements (Pixels) | 1945 x 1097 (2.13 MP) | |
| Resolution | Full HD (1080p) | |
| Lens | 30x motorized Zoom 4.3 mm to 129 mm F1.6 to F4.7 | |
| Field of View (FOV) | 2.3° to 63.7° | |
| Focus | Automatic with manual override | |
| Iris | Automatic with manual override | |
| Digital Zoom | 12x | |
| Sensitivity (3100K, reflectivity 89%, 1/30, F1.6, 30 IRE) | Color 0.0077 lx | Monochrome 0.0008 lx |
| Gain Control | AGC, Fixed | |
| Aperture Correction | Horizontal and vertical | |
| Electronic Shutter Speed (AES) | 1/1 sec to 1/10000 sec (22 steps) | |
| Signal-to-Noise Ratio (SNR) | >55 dB | |
| Day/Night switch | Automatic IR cut filter | |
| White Balance | 2000 K to 10,000 K ATW, AWB Hold, Extended ATW, Manual, Sodium Lamp Auto, Sodium Lamp | |
| Day/Night | Monochrome, Color, Auto | |
| Intelligent Defog feature | Improves visibility when viewing foggy or other low-contrast scenes. | |
| High dynamic range (HDR) | 120 dB (25/30 fps) | |

| DORI | DORI definition | Distance to Object | | |
|-----------|---------------------|--------------------|------------------|---------------|
| | | WIDE 1X | TELE 30X | Scene width |
| Detect | 25 px/m (8 px/ft) | 62 m (203 ft) | 1913 m (6276 ft) | 77 m (252 ft) |
| Observe | 63 px/m (19 px/ft) | 25 m (81 ft) | 765 m (2510 ft) | 31 m (100 ft) |
| Recognize | 125 px/m (38 px/ft) | 12 m (41 ft) | 383 m (1255 ft) | 15 m (50 ft) |
| Identify | 250 px/m (76 px/ft) | 6 m (20 ft) | 191 m (628 ft) | 8 m (25 ft) |

Video content analysis

| | | | |
|--------------------------|---|----------------------|----------------------|
| Analysis type | Intelligent Video Analytics | | |
| Configurations | Off / Global VCA / Profiles 1 - 16 | | |
| | | Visible image | Thermal image |
| Masking | | x | x |
| Alarm rules (combinable) | Any object | x | x |
| | Object in field | x | x |
| | Crossing line | x | x |
| | Entering field | x | x |
| | Leaving field | x | x |
| | Loitering | x | x |
| | Following route | x | x |
| | Counter | x | x |
| | Condition change | x | x |
| | Similarity search | x | x |
| | Flow / counter flow | x | x |
| | Face detection | x | |
| | Tampering | x | |
| | Motion+ | x | x |
| | Idle object | x | |
| Removed object | x | | |
| Crowd density estimation | x | | |
| Object filters | Duration | x | x |
| | Size | x | x |
| | Aspect ratio v/h | x | x |
| | Speed | x | x |
| | Direction | x | x |
| | Object classes (Upright persons, Bikes, Cars, Trucks) | x | x |
| | Color | x | |
| Tracking Mode | Standard tracking (2D) | x | x |
| | 3D tracking | x | x |
| | 3D people tracking | x | x |

| | | |
|---------------|---|---|
| Ship tracking | x | x |
| Museum mode | x | x |

Network

| | |
|--|--|
| Standard/Video compression | H.265, H.264 (ISO/IEC 14496), M-JPEG, JPEG |
| Streaming | Multiple and independent streams using H.264 or H.265, plus M-JPEG. Configurable frame rate and bandwidth. Regions of Interest (ROI). |
| Supported Streams | SD 720p 1080p D1 4:3 (cropped) 640x480 1280x1024 (cropped) |
| Resolution (H x V) | |
| 1080p HD | 1920 x 1080 |
| 720p HD | 1280 x 720 |
| 432p SD | 768 x 432 |
| 288p SD | 512 x 288 |
| 144p SD | 256 x 144 |
| Protocols | IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, ARP, DHCP, APIPA (Auto-IP, link local address), NTP (SNTP), SNMP (V1, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, no-ip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox, CHAP, digest authentication |
| Note: Dropbox is a trademark of Dropbox, Inc. | |
| Ethernet | 10BASE-T/100BASE-TX, auto-sensing, half/full duplex |
| Encryption | TLS 1.0, SSL, DES, 3DES, AES |
| Ethernet connector | RJ45 |
| GOP Structure | IP, IBP, IBBP |
| Data Rate | H.265, 1080P: 61 kbps to 2.8 Mbps (depending on the scene, the frame rate, and the quality settings) H.264: 9.6 kbps to 6 Mbps |
| IP Delay (camera only) | 30fps: 120ms 60fps: 67ms |
| Connectivity | ONVIF Profile S, ONVIF Profile G, Auto-MDIX |
| Quality of service (QoS) | User-selectable options |

Additional functions

| | |
|----------------------|--|
| Video authentication | Off / Watermark / MD5 / SHA-1 / SHA-256 |
| Display Stamping | Name, Time, Pre-position title, Sector title, Compass/telemetry, Lens zoom factor, Alarm message, Custom Logo bitmap |
| Pixel Counter | Selectable area |
| Live image indicator | On/Off |

For standard scenes, the average typical optimized bitrate in kbits/second for various visible imaging frame rates is shown in the following table:

| FPS | 1080p | | 720p | |
|-----|-------|-------|-------|-------|
| | H.264 | H.265 | H.264 | H.265 |
| 60 | 4200 | 1649 | 2600 | 1249 |
| 30 | 2600 | 1413 | 1300 | 1096 |
| 15 | 2100 | 1157 | 1100 | 902 |
| 12 | 1800 | 1075 | 1000 | 841 |
| 5 | 1250 | 746 | 600 | 597 |
| 2 | 500 | 407 | 270 | 343 |

For standard scenes, the average typical optimized bitrate in kbits/second for various thermal imaging frame rates is shown in the following table:

| FPS | 320 Resolution | | 640 Resolution | |
|-----|----------------|-----|----------------|-----|
| | H.264/H.265 | FPS | H.264/H.265 | FPS |
| 60 | 360 | 30 | 850 | |
| 30 | 196 | 15 | 510 | |
| 15 | 125 | 9 | 250 | |
| 12 | 105 | 4.5 | 180 | |
| 10 | 96 | 3 | 105 | |
| 7.5 | 77 | 1 | 70 | |
| 6 | 70 | | | |
| 5 | 63 | | | |
| 4 | 55 | | | |
| 3 | 52 | | | |
| 2 | 31 | | | |
| 1 | 15 | | | |

Actual bitrate may vary depending on the scene complexities and encoding configurations.

Local Storage

| | |
|--------------------|---|
| Recording capacity | 16GB of internal EMMC-based memory. Provides local recording for minimum of 4 hours that includes continuous recording at maximum fps of both visible and thermal image streams, metadata, and audio. |
|--------------------|---|

Access and Data Security

| | |
|--|--|
| Password protection | Three-level |
| Web browser protection type | HTTPS |
| Firmware updates | Protected with authenticated secure uploads |
| Trusted Platform Module (TPM) | Supported |
| Public Key Infrastructure (PKI) | Supported |
| 802.1x network authentication with EAP/TLS | Supports TLS 1.2 with updated cipher suites including AES 256 encryption |
| 802.1x authentication using a RADIUS (Remote Authentication Dial In User Service) server | Supported |
| SSL certificate for use with HTTPS | Supported |
| AES encryption | Supports independent encryption with 128-bit keys |

Miscellaneous

| | |
|---------------------|---|
| Sectors / Title | 4, 8, 12, or 16 user-selectable, independent Sectors, each with 20 characters per Title |
| Privacy Masks | 32, individually configurable; maximum 8 per Pre-position; programmable with 3, 4 or 5 corners; selectable color of Black, White, or Gray, as well as an "Auto" option in which the camera selects the most prevalent of the three colors (Black, White, or Gray) in the background scene as the Pattern color. |
| Virtual Masks | 24 individually configurable Virtual Masks to hide parts of the scene (background motion such as moving trees, pulsating lights, busy roads, etc.) which should not be considered for flow analysis to trigger Intelligent Tracking. |
| Pre-positions | 256, each with 20 characters per Title |
| Guard Tours | Custom Recorded Tours - two (2), total duration 30 minutes: Pre-position tour - one (1), consisting of up to 256 scenes consecutively, and one (1) customized with up to 256 user-defined scenes |
| Supported Languages | English, Czech, Dutch, French, German, Italian, Polish, Portuguese, Russian, Spanish, Japanese, Chinese |

| | |
|--|---|
| Alarm control | Rules-based logic supports basic and complex pre-defined user-specified commands In its most basic form, a “rule” could define which input(s) should activate which output(s). |
| Washer Pump Interface | Control functions integrated. Alarm/Washer Interface Unit (MIC-ALM-WAS-24, sold separately) provides electrical interface to user supplied washer pump device. |
| Camera status monitoring | Integrated sensors monitor operational status such as internal temperature, humidity level, incoming voltage level, vibration, and shock events. |
| Diagnostics | Various status conditions are tracked in internal diagnostic log. Critical fault conditions will also be displayed on screen. |
| Supported mounting options (with applicable accessories) | Direct to a surface On a wall (Cables through the wall) On a wall (Conduit/cables down the wall) On the corner of a wall On a pole |

Mechanical

| | |
|---------------------------------|---|
| Drive Unit | Brushless, integral pan/tilt motor drive |
| Supported mounting orientation | Upright Inverted |
| Pan Range | 360° continuous rotation |
| Tilt Angle | 292° |
| Tilt Range | Upright unit: -56° to +90° Inverted unit: -90° to +56° |
| Variable Pan Speed | 0.2°/second to 120°/second |
| Variable Tilt Speed | 0.2°/second to 90°/second |
| Intelligent Tracking Speed | 4°/second to 120°/second |
| Pre-position Speed | Maximum 120°/second, with no more than 2.5 seconds to reach new position (excluding time to zoom and focus at new position) |
| Preposition Accuracy | 0.05° (typical) |
| Proportional Pan / Tilt to Zoom | Yes |
| Audible Noise | <65 dB |

Electrical

| | |
|---------------------|--|
| Input Voltage | 21-30 VAC, 50/60 Hz, and/or High Power over Ethernet 56VDC nominal |
| Current Consumption | 4.0A (24 VAC) 1.5A (High PoE) |

| | |
|--|--|
| Power Consumption (typical) (Includes integrated heater, defroster, and fan) | 72W (24 VAC) 72W (High PoE) |
| High PoE | 95W High Power over Ethernet (Requires NPD-9501A midspan from Bosch (sold separately).) 56VDC |
| Redundant configuration | Connect both High PoE Midspan and a separate 24 VAC power source. If either the High PoE or 24 VAC power source fails, the camera seamlessly transitions over to use the remaining power source. |
| Surge protection | Built-in surge protection for power, data, and network interfaces |

Communications / Software Control

| | |
|----------------------------|---|
| Camera Setup/ Control | Via Internet Explorer web browser version 7.0 or later, Bosch Configuration Manager, Bosch Video Management System (BVMS), Bosch Video Security Client (VSC), or support for third party software |
| Supported Serial Protocols | Bosch OSRD, Pelco D/P, Forward Vision, Cohu. Requires separate eLicense installation. |
| Cloud-based services | Time-based or alarm-based JPEG posting to four different accounts. Accounts can address FTP servers or cloud-based storage facilities. Alarm events can be set up to trigger an e-mail or SMS notification. |
| Firmware upload | Completed over network using built-in web browser or from Bosch Configuration Manager |

User Connections

| | |
|-----------------------------------|--|
| Accessory Interface/ Control Data | RS-485, Simplex, half and full duplex, user-selectable baud rate or auto-baud Used to communicate with optional Alarm/washer interface box (MIC-ALM-WAS-24) or with Bosch OSRD, Pelco P/D, Forward Vision, and Cohu serial protocols. |
| Power, network | Ethernet High PoE (95 W) RJ45 10/100Base-Tx, male connector; Female-to-female RJ45 coupler included |
| Power, pigtail | 24 VAC (nominal) |
| Chassis ground | Ground wire with connector lug |

Audio

| | |
|-----------------------------|---|
| Compression | G.711, AAC, and L16 (live and recording) |
| Signal-to-Noise Ratio (SNR) | Audio-in: 47 dBA (A-weighting) Audio out: 50 dBA (A-weighting) |

| | |
|------------------|---|
| Mode | Two-way, full duplex audio communication |
| User connections | Line in: 15k ohm typical, 1.0Vrms, max Line out: 0.8Vrms at 12K ohm, typical |

Environmental

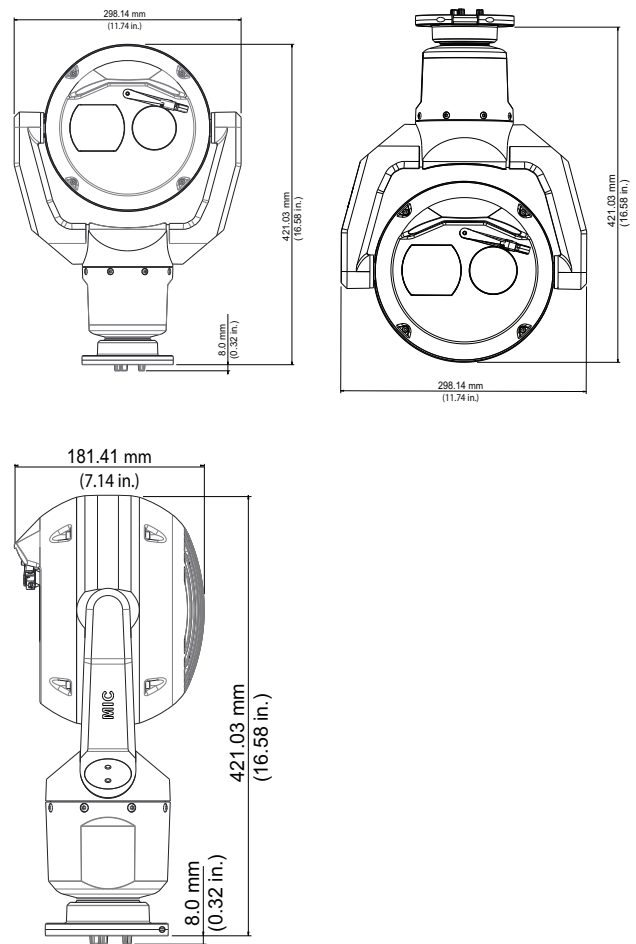
| | |
|--|---|
| Ingress Protection Rating/Standard | IP68 / Type 6P (dust and immersion) when installed on a MIC-DCA or on a MIC wall mount IP67 (moisture and dust) rating on connectors in the base of the camera when using the IP67 Connector Kit (MIC-9K-IP67-5PK), which is also required when using non-Bosch mounts IP66 (directed spray) when installed on a MIC-DCA or on a MIC wall mount |
| External Mechanical Impact (IK Code or Impact rating) | IK10 (excluding windows) |
| Operating temperature | -40 °C to +65 °C (-40 °F to +149 °F) |
| NEMA TS 2-2003 (R2008), para 2.1.5.1 using fig. 2.1 test profile | -34 °C to +74 °C (-30 °F to +165 °F) |
| Storage Temperature | -40 °C to +70 °C (-40 °F to +158 °F) |
| Humidity | 0 to 100% |
| Wind Load | 160 km/h (100 mph) (sustained) 241 km/h (150 mph) (gusts) |
| Effective Projected Area (EPA) | Camera: 0.0910 m ² / 0.98 ft ² Camera and sunshield: 0.0929 m ² / (1.00) ft ² MIC Wall Mount: 0.0483 m ² / 0.52 ft ² |
| Vibration | IEC 60068-2-6, Test Fc: Vibration (sinusoidal), 10m/s ² (1.0g) Sinusoidal vibration test IAW MIL-STD-167-1A |
| Shock | IEC 60068-2-27, Test Ea: Shock, 45g, 6ms Half Sine Impulse |

Construction

| | |
|------------------------|--|
| Dimensions (W x H x D) | 421 mm x 298 mm x 181 mm (11.74 in. x 16.58 in. X 7.14 in.) |
| Weight | 9.0 kg (19.7 lb) |
| Window | Borosilicate glass (optical) Germanium (thermal) |
| Construction Material | Cast solid aluminum |
| Window Wiper | Integrated, long-life silicone wiper |

| | |
|---|--|
| Heater | Integrated |
| Fan | Integrated |
| Defroster | Embedded in optical and thermal windows, with de-icing capability |
| Sunshield (to minimize sun loading in hot climates) | Optional; sold separately |
| Standard Finish | Chromate-based surface treatment with powder coat paint, sand finish |
| Standard Colors | Black (RAL 9005), White (RAL 9010), Grey (RAL 7001), Desert (Some colors may not be available in some regions.) |

Dimensional Drawings



Ordering information

MIC-9502-Z30BQS PTZ thermal QVGA-19mm 2MP 30x 9Hz, black

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with standard resolution (320x240 pixels), <9 Hz frame rate, and 19 mm lens. Black housing color.

Order number **MIC-9502-Z30BQS**

MIC-9502-Z30WQS PTZ thermal QVGA-19mm 2MP 30x 9Hz, white

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with standard resolution (320x240 pixels), <9 Hz frame rate, and 19 mm lens. White housing color.

Order number **MIC-9502-Z30WQS**

MIC-9502-Z30GQS PTZ thermal QVGA-19mm 2MP 30x 9Hz, gray

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with standard resolution (320x240 pixels), <9 Hz frame rate, and 19 mm lens. Grey housing color.

Order number **MIC-9502-Z30GQS**

MIC-9502-Z30BVS PTZ thermal VGA-50mm 2MP 30x 9Hz, black

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with high resolution (640x480 pixels), <9 Hz frame rate, and 50 mm lens. Black housing color.

Order number **MIC-9502-Z30BVS**

MIC-9502-Z30WVS PTZ thermal VGA-50mm 2MP 30x 9Hz, white

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with high resolution (640x480 pixels), <9 Hz frame rate, and 50 mm lens. White housing color.

Order number **MIC-9502-Z30WVS**

MIC-9502-Z30GVS PTZ thermal VGA-50mm 2MP 30x 9Hz, gray

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with high resolution (640x480 pixels), <9 Hz frame rate, and 50 mm lens. Grey housing color.

Order number **MIC-9502-Z30GVS**

MIC-9502-Z30BVF PTZ thermal VGA-50mm 2MP 30x 30Hz, black

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with high resolution (640x480 pixels), 30 Hz frame rate, and 50 mm lens. Black housing color.

Order number **MIC-9502-Z30BVF**

MIC-9502-Z30WVF PTZ thermal VGA-50mm 2MP 30x 30Hz, white

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with high resolution (640x480 pixels), 30 Hz frame rate, and 50 mm lens.

White housing color.

Order number **MIC-9502-Z30WVF**

MIC-9502-Z30GVF PTZ thermal VGA-50mm 2MP 30x 30Hz, gray

Ruggedized dual thermal/visible PTZ camera. 30x visible zoom. Thermal imager with high resolution (640x480 pixels), 30 Hz frame rate, and 50 mm lens. Grey housing color.

Order number **MIC-9502-Z30GVF**

Accessories

MIC-DCA-HB Deep conduit mount, M25 holes, black

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands.

Black (RAL 9005) color.

Order number **MIC-DCA-HB**

NPD-9501A Midspan, high PoE, single port, AC in

High PoE, 95 W, Single port indoor Midspan. 120/230VAC input. Supplies a data and power interface to camera using a single standard CAT5e (or better) network cable.

Order number **NPD-9501A**

MIC-DCA-HW Deep conduit mount, two M25 holes, white

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands.

White (RAL 9010) color.

Order number **MIC-DCA-HW**

MIC-DCA-HG Deep conduit mount, two M25 holes, grey

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands.

Grey (RAL 7001) color. Available in specific regions only.

Order number **MIC-DCA-HG**

MIC-DCA-HBA Deep conduit mount, M25 holes, black

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.

Black (RAL 9005) color.

Order number **MIC-DCA-HBA**

MIC-DCA-HWA Deep conduit mount, M25 holes, white

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.

White (RAL 9010) color.

Order number **MIC-DCA-HWA**

MIC-DCA-HGA Deep conduit mount, M25 holes, grey
DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only. Grey (RAL 7001) color.
Order number **MIC-DCA-HGA**

MIC-CMB-BD Corner mount bracket, black
Corner mount bracket, black sand finish (RAL9005)
Order number **MIC-CMB-BD**

MIC-CMB-WD Corner mount bracket, white
Corner mount bracket, white sand finish (RAL9010)
Order number **MIC-CMB-WD**

MIC-CMB-MG Corner mount bracket, grey sand
Corner mount bracket.
Grey (RAL 7001). Available in specific regions only. Sand finish.
Order number **MIC-CMB-MG**

VG4-A-PSU1 PSU, 120VAC, for AUTODOME, MIC7000
Power supply, 120VAC input, 24VAC output @ 96VA. Suitable for powering AUTODOME, MIC IP 7000, and MIC IP fusion 9000i cameras. White aluminum enclosure with cover. IP66 ingress. IK10 impact.
Order number **VG4-A-PSU1**

MIC-WMB-BD Wall mount bracket , black
Wall mount bracket, black sand finish (RAL9005)
Order number **MIC-WMB-BD**

VG4-A-PSU2 Power supply, 230VAC, AUTODOME, MIC7000
Power supply, 230VAC input, 24VAC output @ 96VA. Suitable for powering AUTODOME, MIC IP 7000, and MIC IP fusion 9000i cameras. White aluminum enclosure with cover. IP66 ingress. IK10 impact.
Order number **VG4-A-PSU2**

MIC-WMB-WD Wall mount bracket, white
Wall mount bracket, white sand finish (RAL9010)
Order number **MIC-WMB-WD**

MIC-WMB-MG Wall mount for rugged PTZ camera, grey
Wall Mount Bracket.
Grey (RAL 7001). Available in specific regions only. Sand finish.
Order number **MIC-WMB-MG**

MIC-PMB Pole mount bracket
Pole mount bracket (includes 2 x 455 mm stainless steel banding straps for pole diameters 75 to 145 mm)
Order number **MIC-PMB**

MIC-SPR-BD Wall mount spreader plate, black sand
Aluminum spreader plate suitable for brickwork surface mounting, black sand finish (RAL9005)
Order number **MIC-SPR-BD**

MIC-SPR-WD Wall mount spreader plate, white sand
Aluminum spreader plate suitable for brickwork surface mounting, white sand finish (RAL9010)
Order number **MIC-SPR-WD**

MIC-SPR-MG Wall mount spreader plate, grey sand
Aluminum spreader plate suitable for brickwork surface mounting.
Grey (RAL 7001). Available in specific regions only. Sand finish.
Order number **MIC-SPR-MG**

MIC-ALM-WAS-24 Interface box, alarm, washer pump, 24VAC
Order number **MIC-ALM-WAS-24**

MIC-SCA-BD Shallow conduit adapter, black sand
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR, black sand finish (RAL9005)
Order number **MIC-SCA-BD**

MIC-SCA-WD Shallow conduit adapter, white sand
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR mount, white sand finish (RAL9010)
Order number **MIC-SCA-WD**

MIC-SCA-MG Shallow conduit adapter, grey sand
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR.
Grey (RAL 7001). Available in specific regions only. Sand finish.
Order number **MIC-SCA-MG**

MIC-WKT-IR Washer kit, MIC IR
Washer kit for analog infrared MIC camera models as well as for MIC IP starlight 7000i and MIC IP fusion 9000i camera models.
Order number **MIC-WKT-IR**

MIC-M25XNPT34 Adapter, M25 to 3/4"NPT, stainless steel
Stainless Steel M25 to 3/4" NPT thread adapter
Order number **MIC-M25XNPT34**

MIC-9K-SNSHLD-W Sunshield thermal PTZ camera, white
Sunshield kit for MIC IP fusion 9000i cameras, white color. Recommended for use with white color MIC IP fusion 9000i cameras installed in locations with high sun load.
Order number **MIC-9K-SNSHLD-W**

MIC-9K-IP67-5PK Connector kit thermal PTZ IP67 5pieces
5-pack weather protection kit for MIC IP fusion 9000i thermal cameras. Provides an IP67-rated barrier against dust or moisture. White color.
Order number **MIC-9K-IP67-5PK**

Software Options

MVS-FCOM-PRCL License key for serial protocol
Serial Protocol Software License (e-license) for IP
Cameras
Order number **MVS-FCOM-PRCL**

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