The DINION IP thermal 9000 RM camera kit is a system for contactless measurement of surface temperature at short range in indoor application scenarios. The total system includes a microbolometer-based DINION thermal camera (NBT-9000-F19QSM), a temperature reference device (IBB-5000-35), a VIDEOJET decoder 7000 (VJD-7513) with embedded thermal analytics, and a keyboard (KBD-UXF) for ease of use.

The system combines the capabilities of the camera to detect thermal temperature with the software algorithm, from Bosch, for temperature detection. The algorithm is embedded in the decoder. Quick, on-site calibration and temperature threshold setup enables the system for alarming in cases where human skin is warmer than the configured threshold.

The system derives its alarm threshold automatically from the histogram of cached temperature data, and will then update the new threshold in order to mitigate the environmental influences. The analytics combine face detection and tracing with a multi-point temperature measurement, which allows to detect the most hottest attainable temperature of a tracked person.

The system includes a temperature reference device (blackbody) that generates a stable temperature for the thermal camera to use as a reference. The camera then uses the data to compensate for possible temperature drift. Different regions have different privacy requirements. To comply with these requirements, and to respect the privacy of the people being scanned, users can select the suitable mode where face temperature and absolute temperature information can be hidden, without reducing either the system accuracy or its effectiveness.

For complete system configuration and model numbers to purchase, see the Ordering Information section.

System overview

The system has the necessary features and functions for users to create either a stand-alone temperature measurement system or an integrated system with multiple cameras.

Stand-alone system

The total system is designed with ease of use in mind. The camera is pre-configured for indoor operation, and has an intuitive user interface via the decoder system for local control and monitoring. Operators can access information such as temperature alarms, temperature...
Integrated System
The system supports the following operation modes:

A. One Camera to One decoder system
This mode is most suitable for sites where a standalone system for spot monitoring is desired. The camera can be interfaced directly to the VIDEOJET decoder 7000 for local single camera display on a monitor. A maximum of two monitors can be connected to a single decoder for spot monitoring of any user-selected camera. The operator can use the keyboard interface to view local playback from decoder memory and temperature alarm.

B. Multi-camera to one decoder
This mode is suitable for buildings where multiple cameras are required and need to be monitored from one monitoring station (for example, dual entry at the building entrance). A maximum of two monitors can be connected to a single decoder for spot monitoring of any user-selected camera or for simultaneous viewing of all associated cameras. The operator can use the keyboard interface to switch between the cameras or select different views, playback from decoder memory and temperature alarm.

C. Multi-camera system distributed system
This mode is suitable for buildings where multiple cameras are required and need to be monitored from multiple stations. The system can be installed using the IP infrastructure, and cameras can be analyzed and displayed using multiple VIDEOJET decoder 7000 units. For long-term storage of video and metadata information, users can add DIVAR IP 5000 series of Bosch recorders to the system.

Functions

Temperature detection
The camera has a high-sensitivity thermal sensor which obtains long-wavelength infrared (LWIR) from target objects. LWIR lets users detect target temperature quickly, without physical contact.

Automatic face detection and tracking
The system supports automatic face detection and tracking when required in the selected profile, a face track keeps a few numbers of the hottest thermal images for closer inspection. A limited number of the most recent face tracks is stored in the face tracks history. The history can be completely anonymous, depending on the configuration, and can be erased easily.

Temperature drift compensation
The system includes a blackbody device as a temperature reference. The reference device with a controlled surface temperature allows for more accurate measurement of absolute temperatures and compensates for temperature drift.

Installation/configuration notes

Kit Contents

1. Do not rely on the measurement, solely or primarily, to diagnose or exclude a diagnosis of COVID-19 or any other disease.
2. Confirm an elevated body temperature, in the context of use, with secondary evaluation methods such as using a non-contact infrared thermometer (NCIT) or a clinical grade contact thermometer.
1 Low-reflective background  
2 Temperature reference device  
3 DINION thermal camera  
4 Adjustable tripod  
5 Monitor showing view from camera  
6 VIDEOJET decoder  
7 Keyboard

### Technical specifications

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<tr>
<th>Specification</th>
<th>Details</th>
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<tr>
<td>Resolution</td>
<td>320x240 (QVGA)</td>
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<tr>
<td>Image sensor</td>
<td>Focal Plane Array (FPA), un-cooled vanadium oxide microbolometer</td>
</tr>
<tr>
<td>Pixel pitch</td>
<td>17 µm</td>
</tr>
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<td>Spectral range</td>
<td>8 µm to 14 µm</td>
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<tr>
<td>Thermal sensitivity</td>
<td>NETD &lt;50mK</td>
</tr>
<tr>
<td>Frame rate</td>
<td>&lt;9 fps</td>
</tr>
<tr>
<td>Lens</td>
<td>19 mm: F1.1</td>
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<tr>
<td>Field of view</td>
<td>H 16° x V 12°</td>
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<tr>
<td>Detection range</td>
<td>2.5 - 4.5m</td>
</tr>
<tr>
<td>Multiple camera support</td>
<td>1 - 4</td>
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<tr>
<td>Target temperature measurement range</td>
<td>+15°C to +45°C (+59°F to +113°F)</td>
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<tr>
<td>Temperature stability and drifting*</td>
<td>&lt;0.2 °C (&lt;0.4 °F) within 14 days</td>
</tr>
<tr>
<td>Laboratory temperature accuracy**</td>
<td>±0.5 °C (±0.9 °F) for ambient temperature +18 °C to +25 °C (+65 °F to +77 °F)</td>
</tr>
<tr>
<td>Operational temperature</td>
<td>+10 °C to +45 °C (+50 °F to +123 °F) (Excluding the temperature reference device)</td>
</tr>
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* and **Follow the test method IEC 80601-2-59 Ed. 2.0.  
**Laboratory temperature accuracy is valid for the temperature range higher than at least 34 °C to 39 °C (93.2 °F to 102.2 °F).

### Ordering information

**NKI-9000-F19QS2 UNITY PKG thermal <9Hz QVGA 19mm RM x2**  
- 2 thermal cameras, VIDEOJET decoder, USB keyboard, 2 temperature reference devices, 2 midspans, 4 tripods  
- Order number **NKI-9000-F19QS2**

**NKI-9000-F19QS1 UNITY PKG thermal <9Hz QVGA 19mm RM x1**  
- Thermal camera, VIDEOJET decoder, USB keyboard, temperature reference device, midspan, 2 tripods  
- Order number **NKI-9000-F19QS1**

**Accessories**

**NBT-9000-F19QSM FIXED THERMAL <9Hz QVGA 19mm Radiometric**  
- Thermal imaging IP camera  
- QVGA  
- 9 fps  
- 19 mm lens  
- Order number **NBT-9000-F19QSM**

**VJD-7513 High-performance H.265 UHD decoder**  
- High-performance video decoder. H.265/H.264 up to 4K UHD and MP; MPEG-4; audio; up to 60fps per stream; HDMI and DisplayPort monitor outputs.  
- Order number **VJD-7513**

**EWE-VJHPD-IW 12mths wrty ext. Videojet h. perf. dec**  
- 12 months warranty extension  
- Order number **EWE-VJHPD-IW**

**KBD-UXF Keyboard, USB CCTV-oriented**  
- USB CCTV-oriented keyboard for use with BVMS, BIS - Video Engine, or DIVAR IP systems.  
- Order number **KBD-UXF**

**EWE-KBDUXF-IW 12mths wrty ext Intuikey Universal XF**  
- 12 months warranty extension  
- Order number **EWE-KBDUXF-IW**

**UML-245-90 23.8 inch FHD LED monitor**  
- 23.8 inch FHD (1920 x 1080) LED monitor  
- Order number **UML-245-90**

**NPD-5001-POE Midspan, 15W, single port, AC in**  
- Power-over-Ethernet midspan injector for use with PoE enabled cameras; 15.4 W, 1-port  
- Weight: 200 g (0.44 lb)  
- Order number **NPD-5001-POE**

**IBB-5000-35 TEMPERATURE REFERENCE DEVICE 3" 35°C**  
- 3-inch temperature reference device calibrated at 35 °C.  
- Order number **IBB-5000-35**

**0601096A00 Tripod BT 250 Professional 1/4"**  
- 1/4-inch professional tripod for fixed cameras.  
- Order number **0601096A00**

**Human Skin Temperature Detection**