



# Technical Specifications



## MOBOTIX M16B Thermal-TR

### Twice As Secure. Even In Total Darkness.

The intelligent video system with an integrated high-performance thermal image sensor takes full advantage of the M16B Thermal TR camera design. Thanks to the two directly adjacent lenses, there is also a thermal overlay function with image overlay (thermal and optical) to pinpoint the exact location of hotspots like smoldering fires in a visible image. The MOBOTIX TR cameras feature a calibrated thermal image sensor. Thermal radiation measurements made across the entire image area can be used to trigger an event based on the temperature increasing above or decreasing below an individually set trigger level (camera alarm, network message, activation of a signal output etc.).

- Mx6 system platform 2nd generation, with MxBus, H.264 and ONVIF compatibility
- Fixed premium thermal image sensor with an NETD of 50 mK
- Thermal Radiometry for measurable added value: calibrated thermal image sensor
- Thermal field of view: 45°, 35°, 25° or 17°
- Additional image sensor module options
- Recording on an internal MicroSD card (4GB as standard)
- Integrated microphone and speaker
- MxActivitySensor can also be used in total darkness
- PoE thermal camera with a power consumption of < 10 W

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**NOTE!** Ceiling mount bracket MX-DH-M24-SecureFlex can be ordered as optional accessory.

# General Product Information

## Basic Information On Thermal Imaging Technology

Thermal imaging technology is a contactless imaging procedure that makes it possible to see the thermal radiation from an object or body otherwise invisible to the human eye (mid-wavelength infrared).

Thermal radiation is electromagnetic radiation emitted by a body based on its temperature. It is caused by thermal motion within a body's molecules. This is the result of accelerated charges that emit radiation in accordance with the laws of electrodynamics.

Thermal imaging technology captures and displays temperature distribution across surfaces and objects.

Thermographic cameras usually display heat intensity information in artificial colors (blue = cooler, red = warmer). In terms of the number of pixels, the resolution is considerably lower than that for cameras capturing the visible spectral range.

Unlike cameras with optical image sensors, one of the decisive quality criteria for a thermal camera is the camera's ability to capture the slightest differences in temperature and to produce an image that displays these differences in colors. The NETD, or Noise Equivalent Temperature Difference, is used to measure the sensitivity of a thermal sensor and is expressed in millikelvin. With an NETD of 50 mK, MOBOTIX thermal cameras can visualize temperature variations starting at 0.05°C, which places them in the top range of cameras currently available for general use.

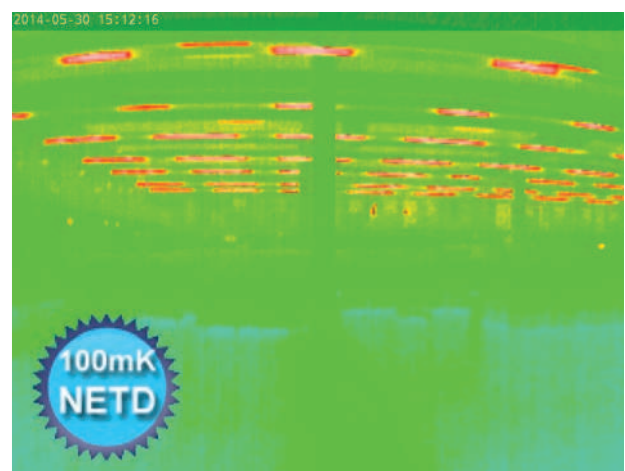
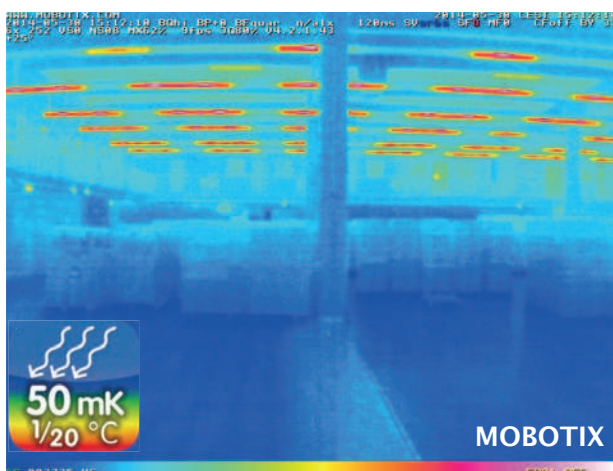
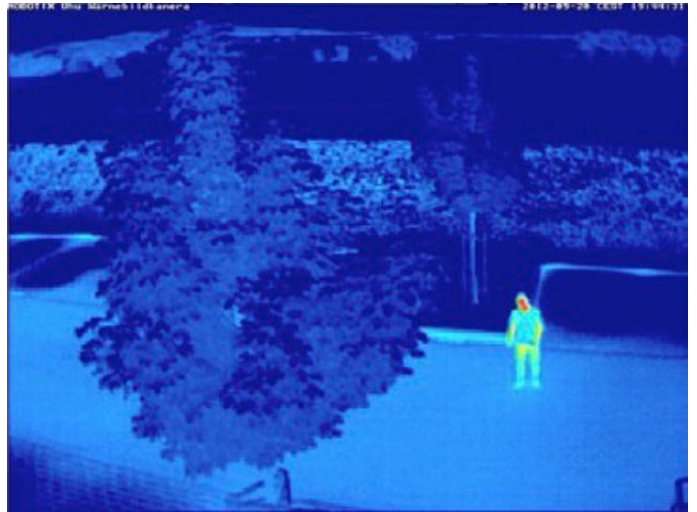


Fig. 1: Thanks to an NETD of 50 mK, the MOBOTIX thermal image (left) shows significantly more details than a competitor's less powerful thermographic camera with an NETD of 100 mK (right).

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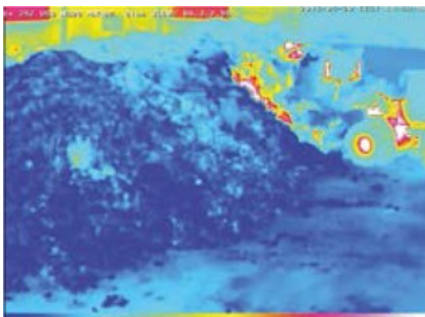
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#### Respecting Privacy

The detected thermal profile of a thermal camera shows no identifiable details for identification of persons and can therefore guarantee privacy. As soon as an object is moving into the relevant surveillance area, MOBOTIX dual camera system can automatically switch from thermal sensor to the optical sensor, producing visible high resolution video. This unique MOBOTIX feature combines two aspects, respecting the privacy aspect and at the same time optimal video surveillance.

#### Temperature Events And Thermal Overlay

Thermal radiometry (TR) cameras from MOBOTIX generate automatic alarms, defined by temperature limits or temperature ranges, which is vital to detect potential fire or heat sources. Up to 20 different temperature triggers can be defined at the same time within so-called TR (Thermal Radiometry) windows or the whole sensor image can be used over the temperature range of -40 to +550 °C. In this way critical situations can be analyzed in the control room in order to plan the next steps for effective fire prevention. Critical assets like emergency generators, wind turbines or radio stations can be cost-effectively maintained and tested remotely. MOBOTIX thermal dual camera systems offer thermal overlay to localize so-called hot spots in the visual image to prevent larger damage. The standard Power-over-Ethernet (PoE) compatibility and the extremely low power consumption of only 6 watts allows operation of MOBOTIX thermal camera systems in every situation.



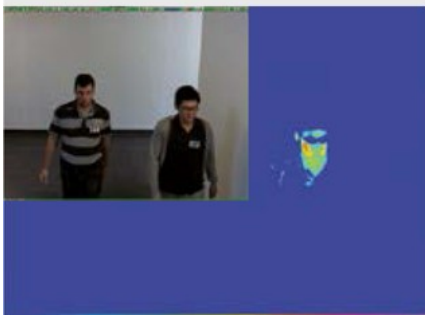
Fire prevention



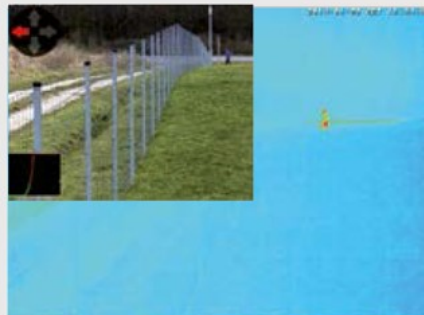
No smoking area



Thermal image overlay



Border control



Perimeter protection



Privacy zones

**NOTE!** Special Export Regulations For Thermal Cameras apply!

Cameras with thermographic image sensors (“thermographic cameras”) are subject to special U.S. and ITAR (International Traffic in Arms Regulation) export regulations:

According to currently valid export regulations from the U.S. and ITAR, cameras with thermographic image sensors or their component parts cannot be exported to countries that have been embargoed by the U.S./ITAR. The corresponding delivery ban also applies to all individuals and institutions included on “The Denied Persons List” (see [www.bis.doc.gov](http://www.bis.doc.gov) under Policy Guidance > Lists of Parties of Concern). These cameras and their installed thermographic image sensors are not to be used for the design, development, or production of nuclear, biological or chemical weapons or installed in these systems.

[Thermal End User Statement on MOBOTIX Website](#)

## Product Information

Specialties

Thermographic IP camera with Thermal Radiometry technology (TR) and Germanium lens; can be optionally equipped with a second optical 6MP sensor module (day/color or night/black and white to be ordered separately for easy self-assembly)

Area of Application

TR temperature measurement of each pixel in the whole image area, up to 20 independent temperature events

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# Thermal Lenses/Sensors, 50 mK, 336 x 252 (Factory-Assembled)

Calibrated Thermal sensor	Mx-M16TB-R075
TR/Thermal Radiometry, horiz./vert. image angle 42°/32° & 45°/35°	Mx-M16TB-R079
Calibrated Thermal sensor	Mx-M16TB-R090
TR/Thermal Radiometry, horiz./vert. image angle 35°/27° & 25°/19°	Mx-M16TB-R119
Calibrated Thermal sensor	Mx-M16TB-R237
TR/Thermal Radiometry, horiz./vert. image angle 17°/13°	
Thermal image sensor	Uncooled microbolometer, 336 x 252 pixels, Pixel Pitch 17 µm, IR range 7,5 to 13,5 µm
Sensitivity NETD (thermal resolution)	Typ. 50 mK, < 79 mK (50 mK is equal to temperature changes of 0,05°C)
Thermal image representation	False colors or black and white
Temperature measuring range (adjustable)	High Sensitivity: -40 to 170°C/-40 to 320°F – Low Sensitivity: -40 to 550°C/-40 to 1022°F
Temperature measuring method (via camera)	Complete image areas (customizable temperature measurement windows)



# Optical Lenses/Sensors, 6MP, 3072 x 2048 (Available With Optional Sensor Module)

Sensor module with Fisheye Lens B016 (180° x 180°), night version optionally with long-pass filter (LPF) Day/Color: Mx-O-SMA-S-6D016 Night/Black&White: Mx-O-SMA-S-6N016 LPF/Black&White: Mx-O-SMA-S-6L016

Sensor module with Ultra Wide Lens B036 (103° x 77°), night version optionally with LPF Day/Color: Mx-O-SMA-S-6D036 Night/Black&White: Mx-O-SMA-S-6N036 LPF/Black&White: Mx-O-SMA-S-6L036

Sensor module with Super Wide Lens B041 (90° x 67°), night version optionally with LPF Day/Color: Mx-O-SMA-S-6D041 Night/Black&White: Mx-O-SMA-S-6N041 LPF/Black&White: Mx-O-SMA-S-6L041

Sensor module with Wide Lens B061 (60° x 45°), night version optionally with LPF Day/Color: Mx-O-SMA-S-6D061 Night/Black&White: Mx-O-SMA-S-6N061 LPF/Black&White: Mx-O-SMA-S-6L061

Sensor module with Standard Lens B079 (45° x 34°), night version optionally with LPF Day/Color: Mx-O-SMA-S-6D079 Night/Black&White: Mx-O-SMA-S-6N079 LPF/Black&White: Mx-O-SMA-S-6L079

Sensor module with Tele Lens B119 (31° x 23°), night version optionally with LPF Day/Color: Mx-O-SMA-S-6D119 Night/Black&White: Mx-O-SMA-S-6N119 LPF/Black&White: Mx-O-SMA-S-6L119

Sensor module with Distant Tele Lens B237 (15° x 11°), night version optionally with LPF Day/Color: Mx-O-SMA-S-6D237 Night/Black&White: Mx-O-SMA-S-6N237 LPF/Black&White: Mx-O-SMA-S-6L237

Sensor module with Super Tele Lens B500 (8° x 6°), night version optionally with LPF Day/Color: Mx-O-SMA-S-6D500 Night/Black&White: Mx-O-SMA-S-6N500 LPF/Black&White: Mx-O-SMA-S-6L500

Sensor module with CS-Mount (no lens included) Day/Color: Mx-O-SMA-S-6DCS Night/Black&White: Mx-O-SMA-S-6NCS

Sensor module with CSVario Lens B045-100-CS Day/Color: Mx-O-SMA-S-6DCSV Night/Black&White: Mx-O-SMA-S-6NCSV

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Image sensor with individual exposure zones	1/1.8" CMOS, 6MP (3072 x 2048), Progressive Scan Color or Black And White
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Light sensitivity in lux at 1/60 s and 1/1 s	Color Sensor: 0,1/0,005 Black And White Sensor: 0,02/0,001
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# Hardware

Microprocessor	iMX 6 Dual Core incl. GPU (1 GB RAM, 512 MB Flash)
H.264 Hardware-Codec	Yes, bandwidth limitation available; output image format up to QXGA
Protection class	IP66 and IK06; with second 6MP sensor module: IK04 with B036 to B237, IK06 with B016
Intended use	Not for use in hazardous areas (Ex area); no mounting behind glass windows
Ambient temperature (range, incl. storage)	-40 to 60°C/-40 to 140°F (cold boot from -30°C/-22°F)
Internal DVR, ex works	4 GB (microSD)
Microphone/speaker	Microphone Sensitivity: -35 +/-4 dB (0 dB = 1 V/pa, 1 kHz) Speaker: 0.9 W at 8 Ohm
16bit/16kHz HD wideband audio (Opus codec)	Yes (live and audio messages)
Passive infrared sensor (PIR)	Yes
Temperature sensor	Yes
Shock detector (tamper detection)	Yes
Power consumption (typically at 20°C/68°F)	9 W (10 W possible over the short term)
PoE class (IEEE 802.3af)	Class 2 or 3 (variable), factory setting: class 3 (required for thermal operation)
Interfaces Ethernet 100BaseT/MxBus/USB	Yes (MxRJ45)/Yes/Yes
Interface RS232	With accessory (MX-232-IO-Box)
Mounting options	Wall, pole or ceiling (wall and ceiling mount included)
Dimensions (height x width x depth)	With wall mount bracket (default): 244 x 158 x 239 mm With ceiling mount bracket (optional accessory MX-DH-M24-SecureFlex): 210 x 158 x 207 mm
Weight	1,320 g

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Housing	PBT-30GF, color: white
Standard accessory	Screws, dowels, screw caps, 2 Allen wrenches, module key, VarioFlex wall and ceiling mount with rubber sealing, 0.5 m ethernet patch cable, 1 blind module, Quick Install
Detailed technical documentation	<a href="http://www.mobotix.com">www.mobotix.com</a> > Support > Download Center
Online version of this document	<a href="http://www.mobotix.com">www.mobotix.com</a> > Support > Download Center
MTBF	> 80,000 hours
Certifications	EN55032:2012 EN55022:2010; EN55024:2010 EN61000-6-1:2007; EN 61000-6-2:2005 EN61000-6-3:2007+A1:2011 EN61000-6-4:2007+A1:2011 AS/ NZS CISPR22:2009+A1:2010 CFR47 FCC part15B
Protocols	IPv4, IPv6, HTTP, HTTPS, FTP, FTPS, SFTP, RTP, RTSP, UDP, SNMP, SMTP, DHCP (client and server), NTP (client and server), SIP (client and server) G.711 (PCMA and PCMU) and G.722
Manufacturer's warranty (since May 2018)	5 years

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# Image Formats, Frame Rates, Image Storage

Available video codecs	MxPEG/MJPEG/H.264
Image formats	Freely configurable format 4:3, 8:3, 16:9 or customized format (Image Cropping), such as 2592x1944 (5MP), 2048x1536 (QXGA), 1920x1080 (Full-HD), 1280x960 (MEGA)
Multistreaming	Yes
Multicast stream via RTSP	Yes
Max. image format (dual image from both sensors)	2x 6MP (6144 x 2048)
Max. frame rate for thermal images, Thermal Overlay and dual images (thermal & optical)	9 frames per second (fps)
Max. frame rate for optional optical 6MP sensor module (fps, only single core used)	MxPEG: 42@HD(1280x720), 34@Full-HD, 24@QXGA, 15@5MP, 12@6MP, 6@2x 6MP MJPEG: 26@HD(1280x720), 13@Full-HD, 9@QXGA, 5@5MP, 4@6MP, 2@2x 6MP H.264: 25@Full-HD, 20@QXGA
Number of images with 4 GB microSD (internal DVR)	CIF: 250,000, VGA: 125,000, HD: 40,000, QXGA: 20,000, 6MP: 10,000

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## General Functions

TR temperature measurement in the whole image area	Yes
Event trigger for temperatures above or below a limit between -40 to 550°C/-40 to 1022°F	Yes
Digital zoom and pan	Yes
ONVIF compatibility	Yes (Profile S, audio support with camera firmware V5.2.x and higher)
Genetec protocol integration	Yes
Programmable exposure zones	Yes
Snapshot recording (pre/post-alarm images)	Yes
Continuous recording with audio	Yes
Event recording with audio	Yes
Time controlled flexible event logic	Yes
Weekly schedules for recordings and actions	Yes
Event video and image transfer via FTP and email	Yes
Playback and QuadView via web browser	Yes
Bidirectional audio in browser	Yes
Animated logos on the image	Yes
Master/Slave functionality	Yes
Privacy zone scheduling	Yes
Customized voice messages	Yes
VoIP telephony (audio/video, alert)	Yes
Remote alarm notification (network message)	Yes

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Programming interface (HTTP-API) Yes

DVR/Storage Management Inside camera via microSD card, externally via USB device and NAS, different streams for live image and recording, MxFFS with archive function, pre-alarm and post-alarm images, monitoring recording with failure reporting

Camera and data security User and group management, SSL connections, IP-based access control, IEEE802.1x, intrusion detection, digital image signature

MxMessageSystem: Yes

Sending and receiving of MxMessages

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## Video Analysis

Video motion detector	Yes
MxActivitySensor	Yes

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## Video Management Software

MxManagementCenter	Yes
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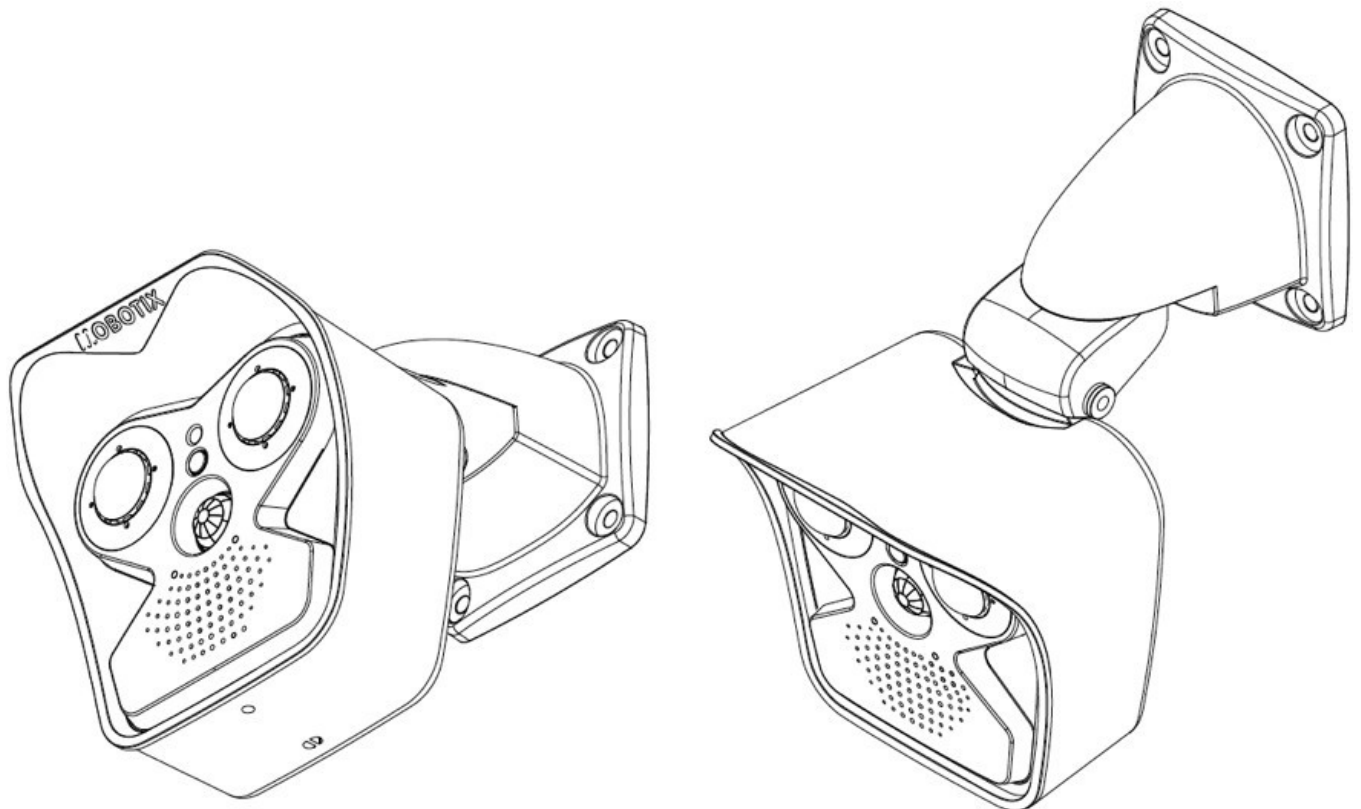
Mobile MOBOTIX App	Yes
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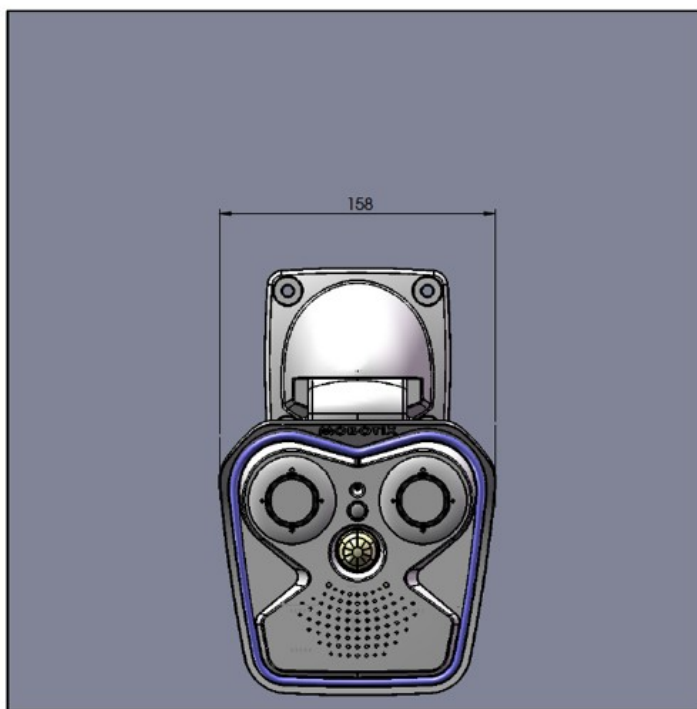
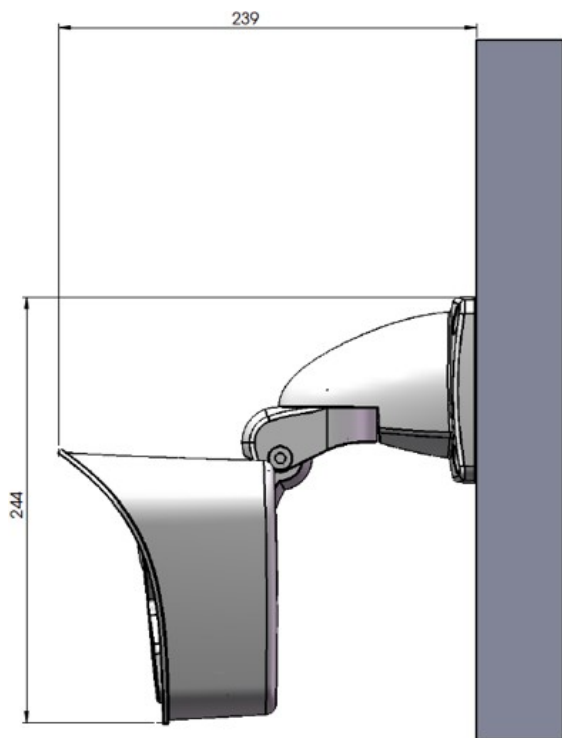
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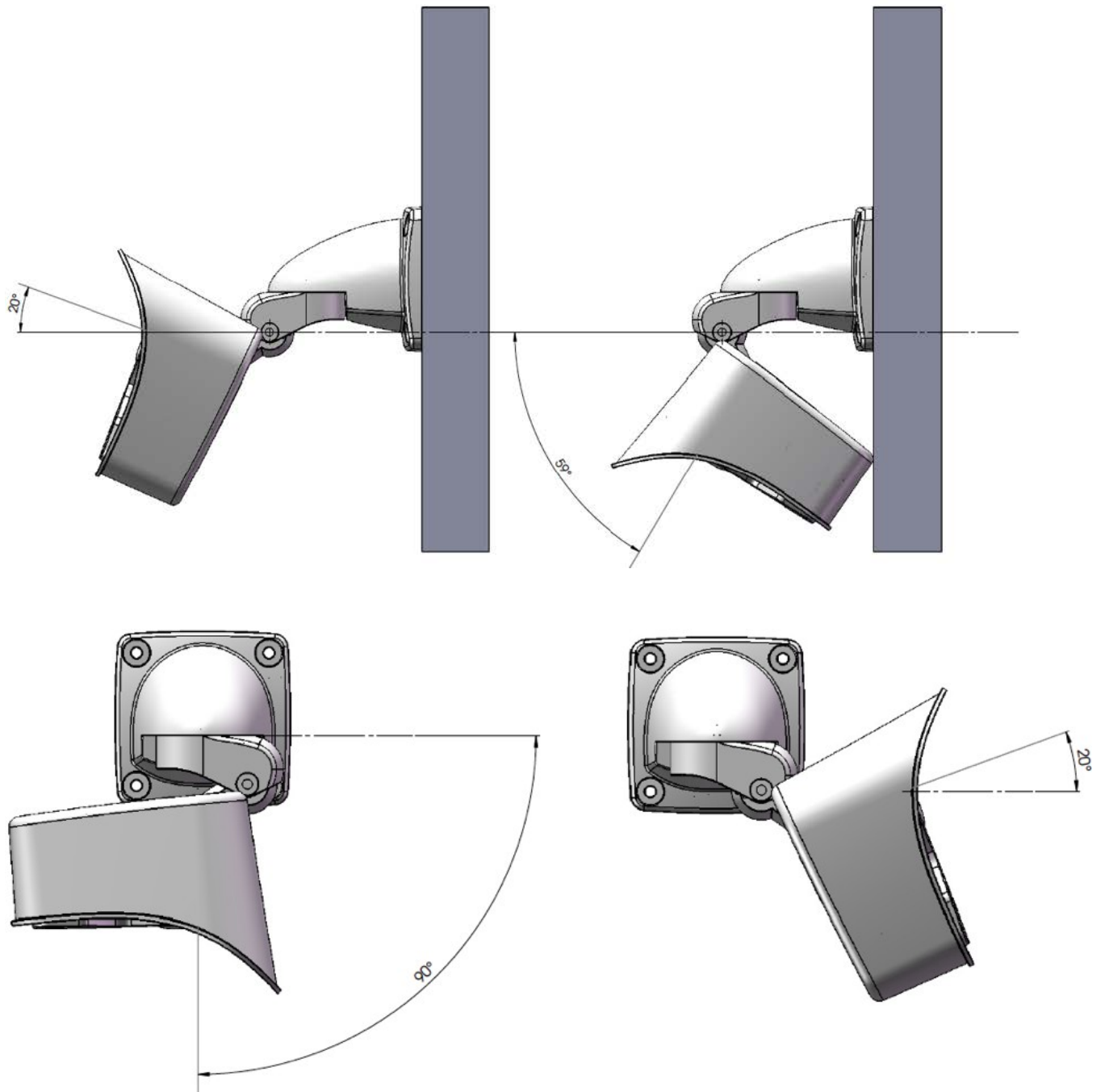
**NOTE!** Download the drilling template from the section or on the MOBOTIX website: [www.mobotix.com](http://www.mobotix.com) > [Support](#) > [Download Center](#) > [Marketing & Documentation](#) > [Drilling Templates](#).

**CAUTION!** Always print or copy the drilling template at 100% of the original size!



# MOBOTIX M16B Thermal-TR with Wall Mount Bracket

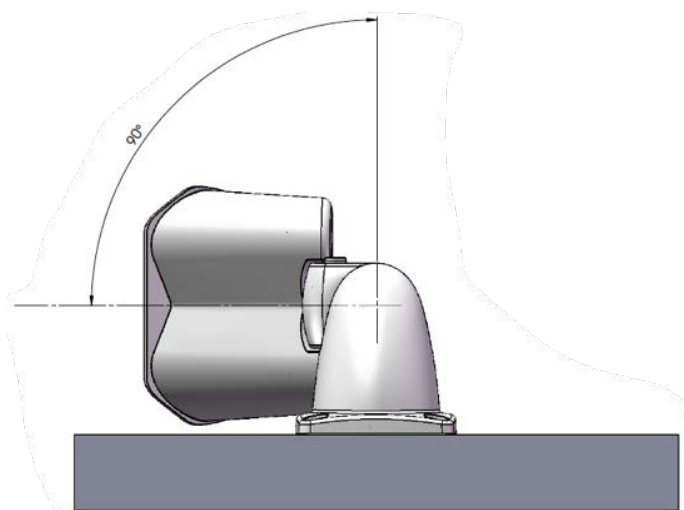




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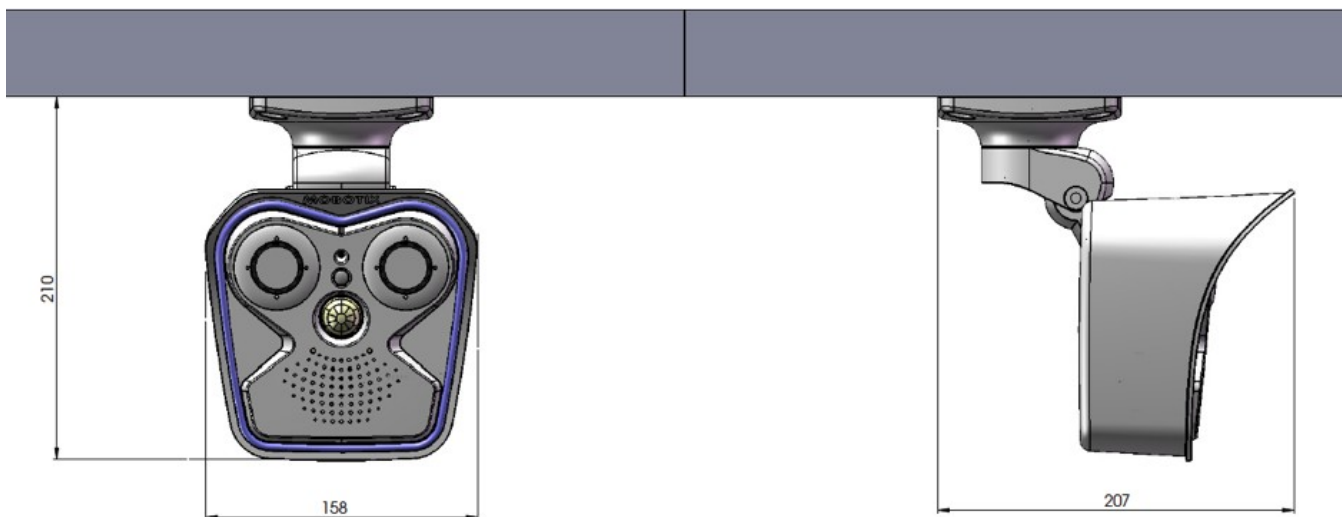
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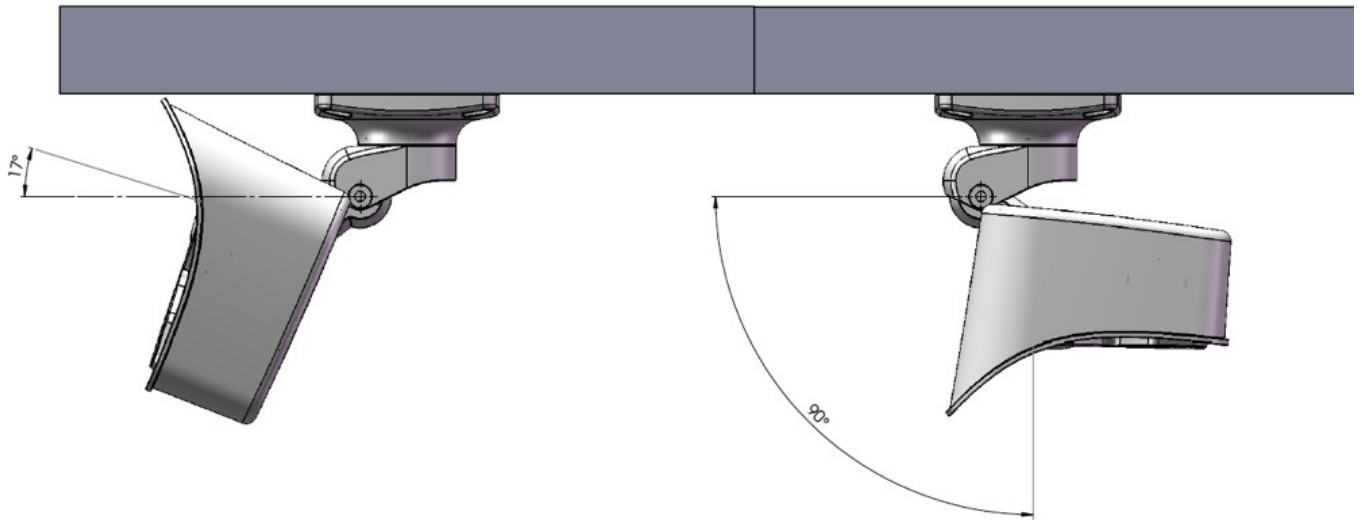
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**NOTE!** All dimensions in mm.

## MOBOTIX M16B Thermal-TR with Ceiling Mount Bracket





**NOTE!**

- Ceiling mount bracket MX-DH-M24-SecureFlex can be ordered as optional accessory.
- All dimensions in mm.

# MOBOTIX

BeyondHumanVision

[EN\\_11/23](#)

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