Technical Specifications

MOBOTIX MOVE 4K (8MP) LIR Video Analytics Speed Dome

Supported by high-performance DNN processor/SoC in combination with state-of-the-art CMOS video sensor, the MOBOTIX MOVE 4K (8MP) LIR Video Analytics Speed Dome is much more than just standard, providing crisp, noise-free and smooth video streaming at high 4K (8MP) resolution even under extreme low-light conditions. The LASER-based object distance measuring LiDAR system ensures precise and fast optical focusing even under difficult environmental and low-light conditions. The integrated DNN-based video analytics functions include face and license plate recognition that can be combined with preset PTZ positions to enable a wide variety of 24/7 video surveillance applications. The MOBOTIX EverClear superhydrophilic and self-cleaning nano coating of the front glass ensures best image quality even in rain and reduces cleaning efforts and operational costs.

- High light sensitivity: 0.02 Lux color, 0.001 Lux B/W
- 31x motorized zoom/focus lens 6.9 to 214.6 mm
- Precise LiDAR focusing system
- WDR up to 130 dB
- Integrated IR illumination up to 300 m/984 ft
- Quad streaming H.264/H.265/MJPEG
- Intelligent encoding, smart low-bitrate control

- MOBOTIX MxMessageSystem
- 2D & 3D motion-compensated noise reduction (MCTF)
- ONVIF Profile S/G/T/M support
- Electronic image stabilizer (EIS)
- Auto object tracking, DNN-based (persons, vehicles)
- DNN video analytics (8 VA, Face & ALPR) linkable to PTZ presets & smart event functions

- Smart Event Functions
- microSD/SDHC/SDXC card support up to 1 TB
- Dual power support (IEEE802.3bt/AC24V)
- Outdoor protection rate IP66, IK10 housing
- Temp. Range –40 to 55 °C/-40 to 131 °F with integrated heater ON
- EverClear coating of front glass

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MOBOTIX MOVE

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High-Quality DNN Edge Video Analytics

Counting	Intrusion	Removed Objects	Sabotage	Face Recognition

Abandoned Objects	Stopped Vehicle	Wrong Direction	Loitering	ALPR

The latest computer vision technology makes the DNN-accelerated video processing engine efficient at the edge. This integrated engine provides high accuracy, real-time object tracking, and 10 (DNN-based) video analytics functions including ALPR and human face recognition. Moreover, it allows simultaneous detection on multiple objects.

MOBOTIX EverClear Nano Coating

The new, groundbreaking MOBOTIX EverClear coating uses a special nano technology that transforms water droplets into an ultra-thin water film immediately upon impact. This ensures the highest image quality in rain and difficult environmental conditions and reduces maintenance costs due to its "self-cleaning" effect.

Product Information

Product Name	4K (8MP) LIR Video Analytics Speed Dome
Order Code	Mx-SD1A-831-LIR-VA

Hardware Design

Processor	Ambarella CV25 (Quad-core ARM® Cortex®-A53, 1 GHz)
Memory	RAM: 512 MB FLASH: 256 MB

Image Sensor	4K (8MP), 1/2.8" Progressive CMOS IMX678 (SONY STARVIS 2)
Effective (Used) Pixels	3864x2180 (4K/8MP)

Lens

Minimum Illumination	Color: 0.02 Lux B/W: 0.001 Lux F1.6, AGC=on, 30 IRE, 1/1 s
Lens Characteristics	Zoom Lens: Zoom, Auto Focus, P-IRIS, Auto-IRIS Focal Length: 6.9 to 214.6 mm Aperture: F1.35 – F4.6 Horizontal Field of View: 61.8° (Wide), 2.2° (Tele) Vertical Field of View: 35.9° (Wide), 1.3° (Tele)
Focus System	Precise LiDAR-based auto focusing system (905 nm wavelength)
Front Glass Coating	Superhydrophilic MOBOTIX EverClear nano coating transforms water droplets into an ultra-thin water film upon impact. The coating ensures best image quality in rain and difficult external conditions and it reduces reflections and noise in low-light scenarios. EverClear is dirt-repellent and increases the stability as well as the scratch-resistance of the front glass, further reducing maintenance efforts. Coating endurance up to 3 years depending on environmental conditions and cleaning treatment.

Camera

Day/Night	Automatically switchable IR-cut filter
Shutter Speed (Auto)	1 to 1/10000 s
Shutter Speed (Manual)	WDR: 1/67500 s Linear: 1/135000 s
Shutter Priority Mode	Up to 1/45 s
Frame Rate (maximum)	**WDR on/off:** H.265/H.264: 4K (8MP)@30 fps MJPEG: 1080p@30 fps

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Auto Gain	Min. gain: 3 dB, max. gain: 48 dB, step size: 3
WDR	Up to 130 dB
Electronic Image Stabilizer (EIS)	Yes
Auto Object Tracking	On/off (object-based DNN algorithm: humans/vehicles selectable)
Zoom	Optical: 31x, Digital: 10x
Image Settings	Color, Brightness, Sharpness, Contrast, White Balance, Exposure Control, 2DNR, 3DNR, NR by Motion, Masking, Text Overlay
Image Rotation	90°, 180°, 270°
Servo Feedback	Yes

PTZ Features

Preset positions	Up to 256 positions, 1 Home position
Sequences	Up to 8 sequences with 64 preset positions each
Cruise Paths	Up to 8
Auto Pan Paths	Up to 4
Display Position	Pan/Tilt degrees can be displayed in live image
Pan Range	360° endless
Tilt Range	−20° to +100°
Pan Speed	Manual Pan Speed: 0.1°–90°/s Preset Pan Speed: 300°/s
Tilt Speed	Manual Tilt Speed: 0.1°–55°/s Preset Tilt Speed: 300°/s
Joystick/Keyport Control	RS485 protocols DSCP, Pelco-D and Pelco-P
Video Analytics	Presets can be combined with 1 selectable integrated video analytics feature

Video Codec

Compression/Encoding	H.265/H.264/MJPEG
Streaming	Up to 4 individually configurable streams in H.264/H.265/MJPEG;

configurable resolution, frame rate, bandwidth LBR/VBR/CBR in H.265/H.264.

Audio Codec

Compression/Encoding	G.711/G.726/AAC/LPCM
Streaming	Bi-directional
Audio Input	Line In Max. 2.28 V_{pp} for line signal Input impedance: 33 kΩ
Audio Output	Line Out Output resistance: 220 Ω Output voltage: 1 V_{rms}

Cyber Security Features

Password Protection	Yes (including "forced" password change during initial setup)
IP address filtering	Yes (to restrict unauthorized access based on IP addresses)
IEEE 802.1X network access control	Yes (for advanced network security and authentication)
Digest authentication	Yes (for secure user authentication)
Secure Boot	Yes (support of fixed IP setting and automatic DHCP IP configuration according to individual MAC address)
AES encryption for password protection	Yes (to ensure strong encryption for password storage)
HTTPS/SSL (using TLS)	Yes (TLS 1.2 default, TLS 1.0/1.1 optional selectable)
User and Group Management	Yes (for fine-grained access control)
VPN	Yes (to establish secure network connections)
Digitally signed firmware	Yes (to prevent firmware file tampering)
RSA encryption	Yes (to support stronger ciphers; supported: RSA (2048 bits), AES-128, AES-256, SHA-256, SHA-384)

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MOBOTIX MOVE 4K (8MP) LIR Video Analytics Speed Dome

Network

Interface	10/100 Mbps Ethernet
Supported Protocols	ARP, PPPoE, IPv4/v6, ICMP, IGMP, QoS, TCP, UDP, DHCP, UPnP, SNMP, SMTP, RTP, RTSP, HTTP, HTTPS, FTP, NTP, DDNS, SMBv2, VPN
ONVIF conformance	Supports profiles S/G/T/M
Supported Browsers	All current browsers are supported.

System Integration

Base Video Analytics	■ Motion detection ■ Audio detection
DNN-Based Video Analytics (linkable to PTZ presets)	■ Abandoned objects ■ Intrusion (object classification/filtering for people, vehicles, etc.) ■ Sabotage ■ Wrong direction ■ Loitering (object classification/filtering for people, vehicles, etc.) ■ Object counting (object classification/filtering for people, vehicles, etc.) ■ Object removal ■ Stopped vehicle (object classification/filtering) 2 analytics functions can be activated simultaneously
Enhanced DNN-Based Video Analytics (linkable to PTZ presets)	■ Face Recognition (incl. gender & age estimation) ■ Number Plate Recognition – supported countries: Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Moldova, Monaco, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan, Turkey, Ukraine, United Kingdom, Uzbekistan, Vietnam
Event Triggers	■ External input

- Analytics
- Network failure detection
- Periodical event
- Manual trigger

Event Actions	- External output activation - Video and audio recording to edge storage - File upload: FTP, network share and email - Notification: HTTP, FTP, email

General

Housing Materials	Metal and plastic
Housing Color	RAL 9003
Power Requirements	IEEE802.3bt, Type 3, class 6, max 51.00 watt AC24V, max 53.10 watt, max 74.80 VA
Connectors	- RJ45 4 x Alarm in, 2x Alarm out, Audio in, Audio out, RS485 terminal block - AC24V terminal block - CVBS connector (available with max. 2 activated streams)
IR Illumination	850 nm; up to 300 m/984 ft distance depending on reflection of scenery
Video Storage	Micro SD/SDHC/SDXC card support up to 1 TB (using SD card adapter), Support for recording to NAS, MOBOTIX HUB, MOBOTIX MOVE NVR
Remotely Upgradable	Yes
Environmental Protection Class	IP66/IK10 (housing only)
Operating Temperature	–40 to 55 °C/-40 to 131 °F with integrated heater ON
Relative Humidity	90 % non-condensing
Storage Conditions	–20 to 70 °C/–4 to 158 °F
Approvals	EMC: CE, FCC, BIS Safety: LVD

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MTBF	50,000 hours
Warranty	5 years; mechanically wearable parts (motor, gears, belts, etc.) excluded
Dimensions	ø 241 x 364 mm
Weight	5500 g

NOTE! Observe the [MOBOTIX MOVE Installation Hints](#) document to ensure optimum performance of the camera features.

Alarm Input/Output Current and Voltage

Alarm In	Alarm Out
5 V with 10 kΩ pull up, 50 mA	400 V DC/AC, 120 mA

DORI Specifications

In the video surveillance context, "DORI" stands for Detection, Observation, Recognition and Identification and was originally based on IEC EN62676-4: 2015. The current DORI standard IEC EN62676-4: 2024 defines the levels listed below.

DORI Levels According to IEC EN62676-4: 2024

These levels define the minimum pixels that a face of a person must have to provide proper identification, for example.

1. **Overview:** To display moving objects at far distances, a minimum of 20 pixels per meter (PPM) is required. This allows for basic perimeter detection and border control applications.
2. **Outline:** For outlining moving objects and their direction, at least 40 PPM is necessary. This is useful for tracking object movements.
3. **Discern:** To discern targets or crowds at a distance, more than 80 PPM is required. This level of detail helps in identifying movements of people, vehicles, or animals.
4. **Perceive:** To perceive targets or crowds, a minimum of 125 PPM is required. Although people cannot be differentiated by gender, their movements can be tracked.
5. **Characterize:** Characterizing people and vehicles requires more than 250 PPM. This level allows for identifying person type, gait, behavior, and vehicle category.
6. **Validate:** For validating known persons or reading vehicle license plates, over 500 PPM is necessary. This is also sufficient for most automatic face recognition software.

7. **Scrutinize:** To scrutinize people, capturing at least 1500 PPM is essential. This ensures high certainty in identifying individuals and recognizing vehicle details like model and year of manufacture. The value for Scrutinize is equivalent to the passport photo size of a person.

DORI Distances

DORI Level Camera	Overview		Outline		Discern		Perceive		Characterize		Validate		Scrutinize	
	Wide-Angle ⇔/↕	Tele ⇔/↕	Wide-Angle ⇔/↕	Tele ⇔/↕	Wide-Angle ⇔/↕	Tele ⇔/↕	Wide-Angle ⇔/↕	Tele ⇔/↕	Wide-Angle ⇔/↕	Tele ⇔/↕	Wide-Angle ⇔/↕	Tele ⇔/↕	Wide-Angle ⇔/↕	Tele ⇔/↕
Mx-SD1A-831-LIR-VA	162 m/168 m 531.50 ft/551.18 ft	5000 m/5156 m 16404.20 ft/16916.01 ft	81 m/84 m 265.75 ft/275.59 ft	2500 m/2578 m 8202.10 ft/8458.01 ft	41 m/42 m 134.51 ft/137.80 ft	1250 m/1289 m 4101.05 ft/4229.00 ft	26 m/27 m 85.30 ft/88.58 ft	800 m/825 m 2624.67 ft/2706.69 ft	13 m/13 m 42.65 ft/42.65 ft	400 m/413 m 1312.34 ft/1354.99 ft	6 m/7 m 19.69 ft/22.97 ft	200 m/206 m 656.17 ft/675.85 ft	2 m/2 m 6.56 ft/6.56 ft	67 m/69 m 219.82 ft/226.38 ft

Dimensions

NOTE! Download the drilling template from the section or on the MOBOTIX website: **www.mobotix.com > Support > Download Center > Marketing & Documentation > Drilling Templates**.

CAUTION! Always print or copy the drilling template at 100% of the original size!
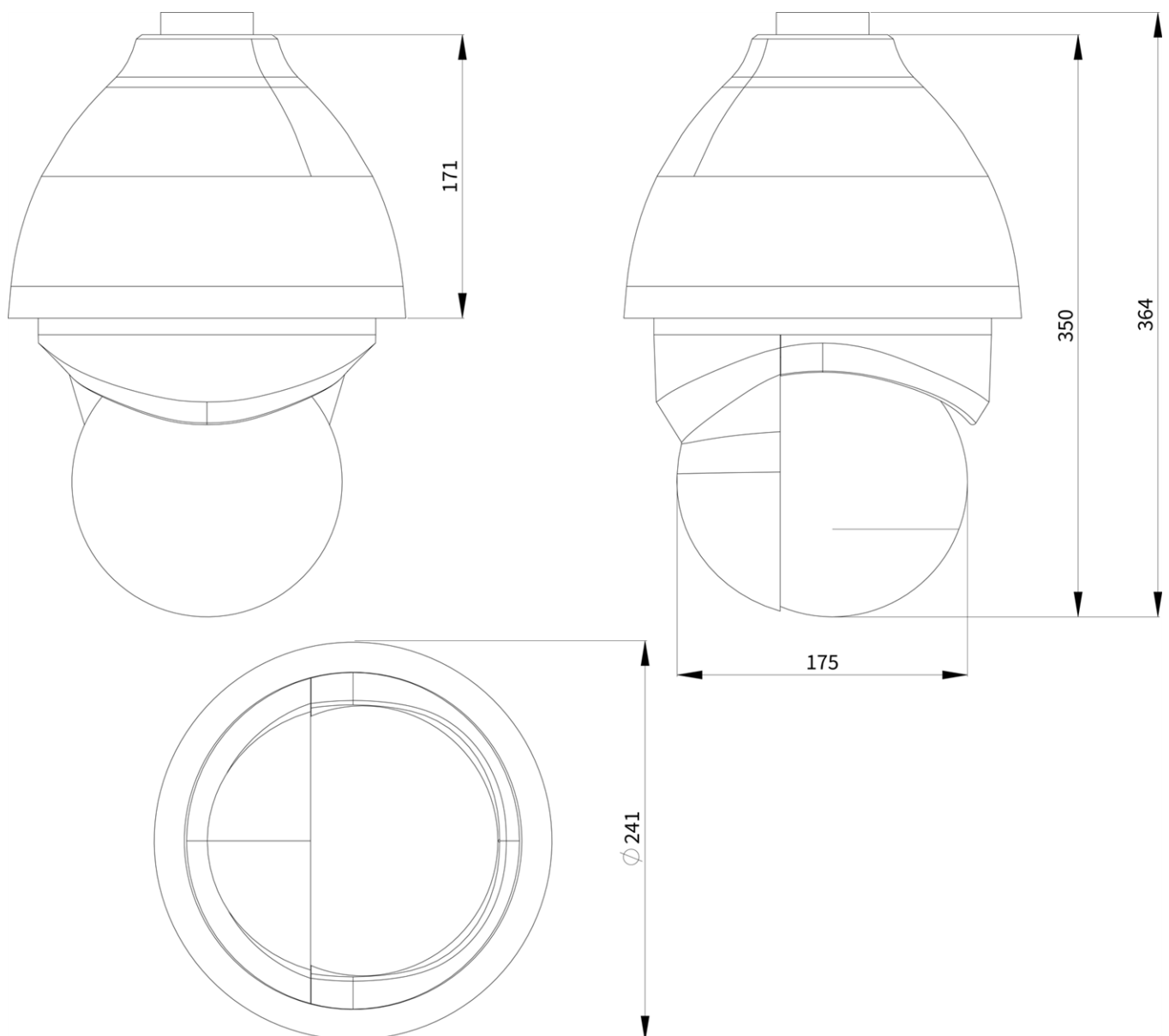
Fig. 1: Mx-SD1A-831-LIR-VA: All measurements in mm

Accessories for Speed Dome Cameras

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
Mx-M-SD-C	Weatherproof corner mount.	Mx-M-SD-W or Mx-M-SD-WL. **CAUTION!** Cannot be used with MX-M-SD-WM or Mx-M-SD-WMJB!	SPCC steel, hammer-blow painted RAL9003	2.17 kg
Mx-M-SD-P	Weatherproof pole mount.	Mx-M-SD-W or Mx-M-SD-WL. **CAUTION!** Cannot be used with MX-M-SD-WM or Mx-M-SD-WMJB!	Zinc-galvanized SECC steel, powder-coated RAL9003	1.58 kg

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
MX-MH-SecureFlex-ESWS	Weatherproof pole mount **for extreme conditions**.	Mx-M-SD-W or Mx-M-SD-WL. **CAUTION!** Cannot be used with MX-M-SD-WM or Mx-M-SD-WMJB!	Stainless steel 3 mm, white	1.23 kg
Mx-M-SD-W	Weatherproof wall mount for MOVE Speed Dome/Vandal Multisensor/Vandal Turret cameras.	All MOVE Speed Dome/Vandal Multi-sensor/Vandal Turret cameras. Can be combined with Mx-M-SD-C or Mx-M-SD-P and camera adaptor plates (MX-M-VT-AP, MX-M-VM-AP, Mx-M-VMSD-AP).	Die-cast ADC12 aluminium alloy, hammer-blow painted RAL9003	0.84 kg
Mx-M-SD-WL	Extended weather-proof wall mount for MOVE Speed Dome/Vandal Multi-sensor/Vandal Turret cameras.	All MOVE Speed Dome/Vandal Multi-sensor/Vandal Turret cameras. Can be combined with Mx-M-SD-C or Mx-M-SD-P and camera adaptor plates (MX-M-VT-AP, MX-M-VM-AP, Mx-M-VMSD-	Die-cast ADC12 aluminium alloy, hammer-blow painted RAL9003	1.5 kg

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Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
		AP).		
  MX-M-SD-WM	Weatherproof wall mount for MOVE Speed Dome/Vandal Multisensor/Vandal Turret cameras. Can also be mounted on top of wall mount junction box MX-M-SD-WMJB.	All MOVE Speed Dome/Vandal Multi-sensor/Vandal Tur-ret cameras. Can be combined with camera adaptor plates (MX-M-VT-AP, MX-M-VM-AP, Mx-M-VMSD-AP). **NOTE!** Can be combined with MX-M-SD-WMJB (wall mount is mounted on top of junction box).	Die-cast ADC12 aluminium alloy, RAL9003	1.3 kg
  MX-M-SD-WMJB	Weatherproof wall mount junction box (IP66) for Mx-M-SD-WM. Allows for com-fortable cabling and installation of addi-tional HW equipment such as PoE Injectors, lightning protection, etc.	All MOVE Speed Dome/Vandal Turret cameras. **CAUTION!** Only to be used as base for Mx-M-SD-WM (wall mount is mounted on top of junction box).	Bracket: Steel, powder-coated RAL9003 Junction box: Die-cast ADC12 aluminium alloy, RAL9003	4.8 kg

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
MX-M-SD-PM	Pendant mount kit incl. base mount, 25 cm/10 in pendant pipe, installation materials and safety wires 50 cm/20 in & 1 m/39 in.	All MOVE Speed Dome/Vandal Multisensor/Vandal Turret cameras. Can be combined with camera adaptor plates (MX-M-VT-AP, MX-M-VM-AP, Mx-M-VMSD-AP).	Die-cast ADC10 aluminium alloy, powder-coated RAL9003	1.58 kg
MX-M-SD-PMEXT	Extension pipe 25 cm/10 in for MX-M-SD-PM.	Extends MX-M-SD-PM; max. extended total length is 1 m/39 in (3 extensions).	Die-cast ADC10 aluminium alloy, powder-coated RAL9003	0.8 kg

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| Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
 MX-M-SD-GN	Weatherproof parapet mount (goose neck; IP66) with integrated junction box. Integrated junction box allows for comfortable cabling and installation of additional hardware equipment such as PoE Injectors, lightning protection, etc.	All MOVE Speed Dome/Vandal Multisensor/Vandal Turret cameras. Can be combined with camera adaptor plates (MX-M-VT-AP, MX-M-VM-AP, Mx-M-VMSD-AP).	Bracket and goose neck: Steel, powder-coated RAL9003 Junction box: Die-cast ADC12 aluminium alloy, RAL9003	14.8 kg
 Mx-A-SD-DCS	Tinted replacement dome for MOVE Speed Dome cameras SD-230 and SD-330.	All MOVE Speed Dome (SD) cameras SD-230 and SD-330.	Ring: Die-cast ADC12 aluminium alloy, powder-coated RAL9003 Dome: Polycarbonate, tinted	0.3 kg
 Mx-A-SD-DCT	Clear replacement dome for MOVE Speed Dome cameras SD-230 and SD-330.	All MOVE Speed Dome (SD) cameras SD-230 and SD-330.	Ring: Die-cast ADC12 aluminium alloy, powder-coated RAL9003 Dome: Polycarbonate, clear	0.3 kg

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
  Mx-A-SD-DBC-EC	Clear **EverClear-coated** replacement dome for MOVE Speed Dome cameras SD-230 and SD-330.	All MOVE Speed Dome (SD) cameras SD-230 and SD-330.	Ring: Die-cast ADC12 aluminium alloy, powder-coated RAL9003 Dome: Polycarbonate, clear	0.58 kg
  MX-A-SD-DBT-EC	Tinted **EverClear-coated** replacement dome for MOVE Speed Dome cameras SD-230 and SD-330.	All MOVE Speed Dome (SD) cameras SD-230 and SD-330.	Ring: Die-cast ADC12 aluminium alloy, powder-coated RAL9003 Dome: Polycarbonate, tinted	0.58 kg

Dimensions

Order Code	Dimensions

Mx-M-SD-C
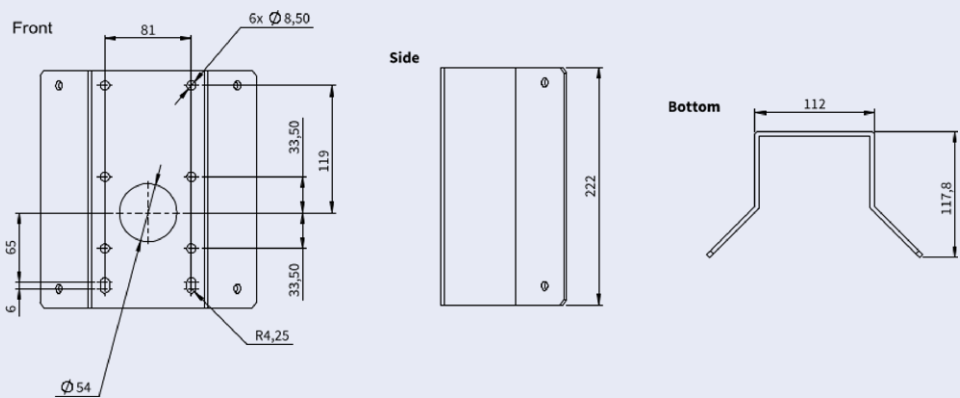
Mx-M-SD-P
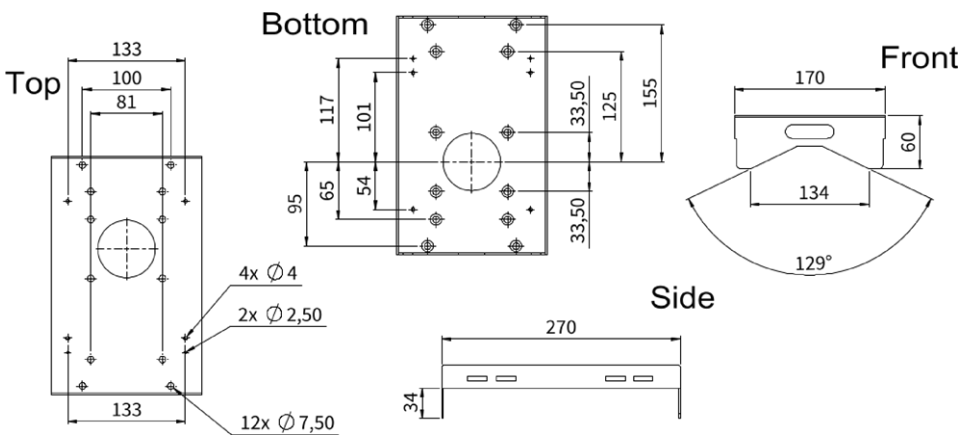
Mx-M-SD-W
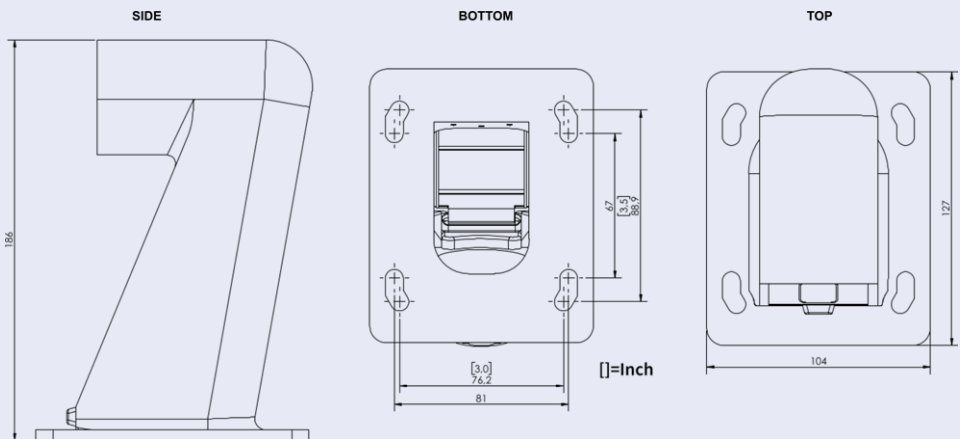
Order Code	**Dimensions**
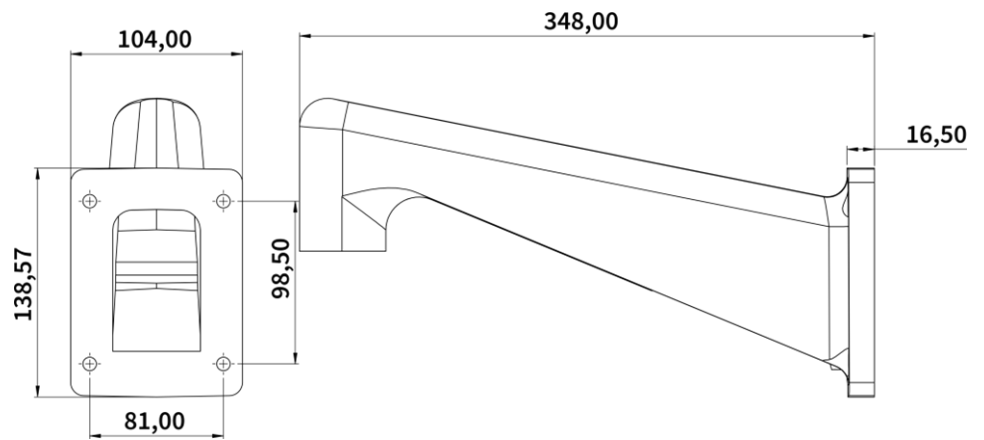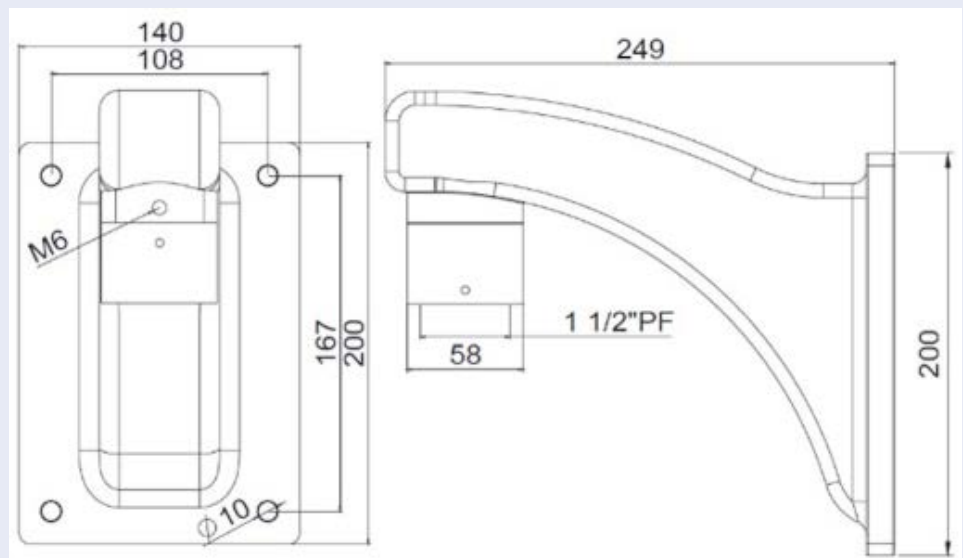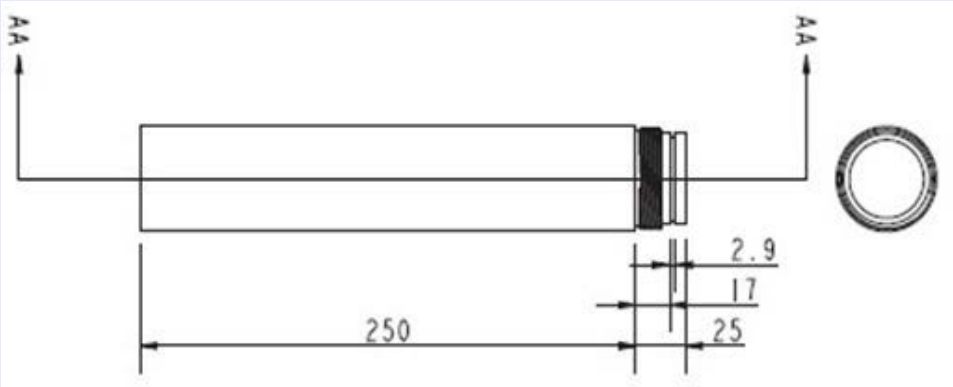
Mx-M-SD-WL
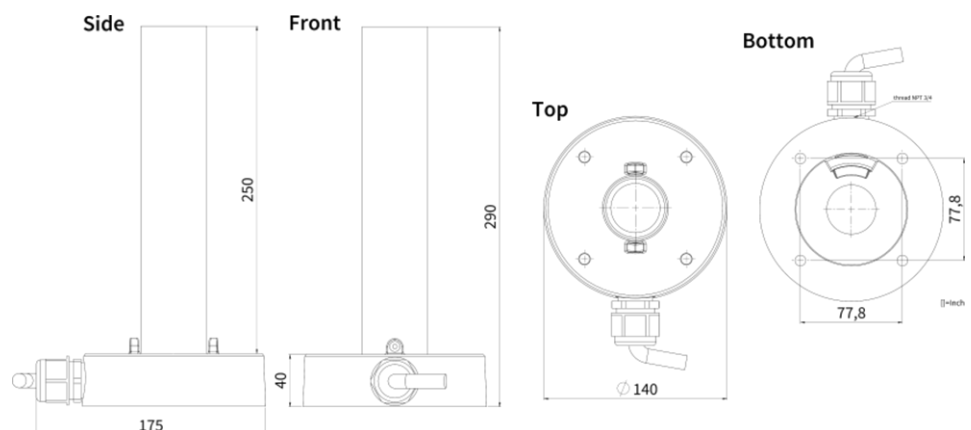
MX-M-SD-WM

MX-M-SD-PM

Technical Specifications

MOBOTIX MOVE 4K (8MP) LIR Video Analytics Speed Dome
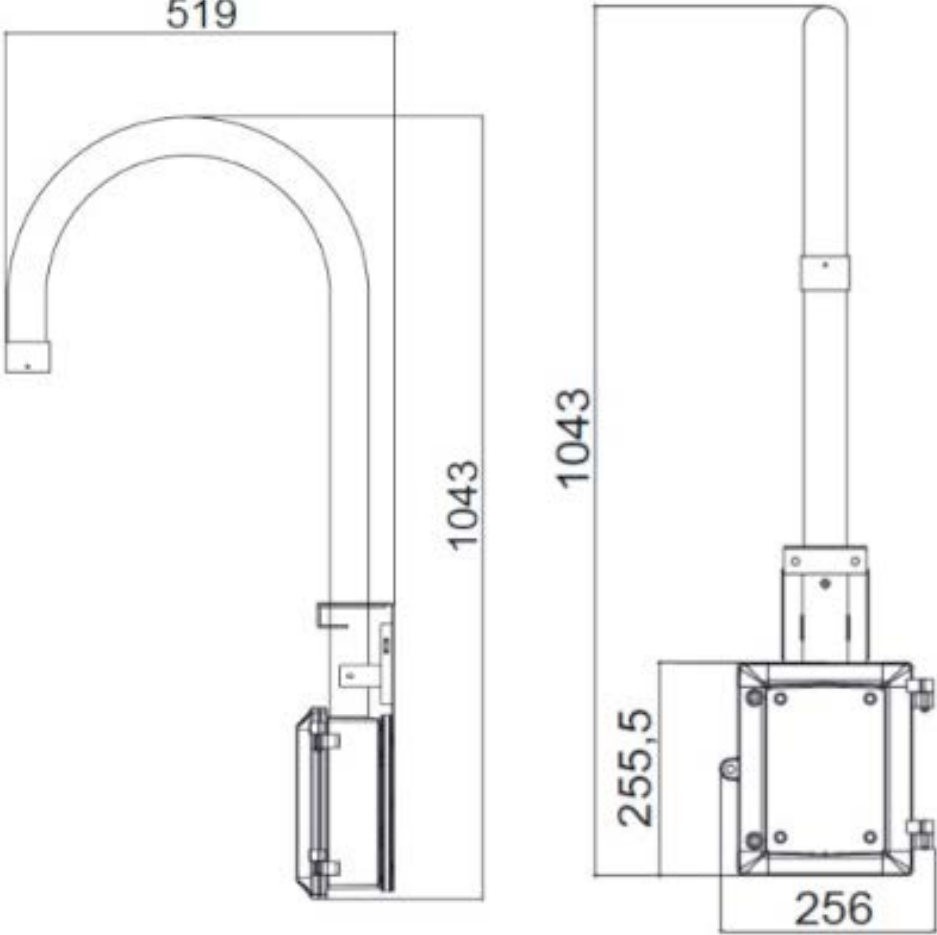
Order Code	Dimensions
MX-M-SD-PMEXT	
MX-M-SD-GN	

Order Code   **Dimensions**

MX-M-SD-WMJB

FRONT   SIDE

256
166
Ø32
108
210
256
136
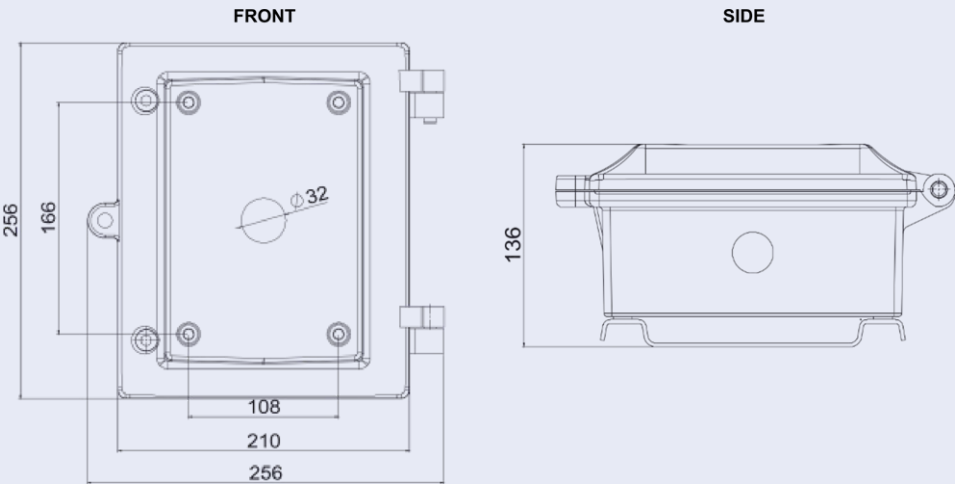
All measurements in mm.

Accessories for All Cameras

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
Mx-NPA-PoE1A-60W-BT	PoE++ Power Network Injector 60 Watt. AC Input Voltage: 100 to 240 VAC (50 to 60Hz) • AC Input Current: 1.5A @100-240 VAC • Operating Ambient Temperature: • -10º to 40ºC @60W • -10º to 50ºC, humidity 10 to 90% @30W • IEEE 802.3bt compliant • Output power of 60W over 4-pairs • Supports 10/100/1000Base-T applications • Plug-and-play installation • Full Protection OVP, OCP • Additional required power cord C14-type not included • Warranty: 1 year.	All cameras.	Plastic housing, black	0.318 kg
Mx-A-ETP1A-2601-POW	Plug-type power supply for Mx-A-ETP1A-2601-SET. Output: 57V DC +/-3% / 1.2 A • Input: 90-260V AC (47-63Hz) • 68,4 Watt • Operating Temperature: 0–40°C/32–122°F	Mx-A-ETP1A-2601-SET	Plastic housing, black	0.49 kg

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
Mx-A-KBD1A-PTZ-JOG	MOBOTIX USB Keyboard with PTZ Joystick & Jog-Shuttle. USB control panel for operating MOBOTIX MxMC 2.6 and higher and MOBOTIX HUB incl. Control of software PTZ and motorized PTZ cameras and pan/tilt devices • Integrated 3-axis joystick • Integrated jog shuttle • 38 control keys with backlight predefined for MxMC functions or freely definable for MOBOTIX HUB • Integrated alarm buzzer • Suitable for operation as HID device on MOBOTIX VMS with Windows and MAC based operating systems via USB 2.0 • Suitable for right- and left-handed users • Power supply: USB, max. 350 mA • Operating temperature: 0°–45°C/32–113 °F.	All cameras. Requires Windows or macOS computer with USB 2.0 or better.	Plastic housing, black	1.9 kg
MX-SWITCH1	MOBOTIX network switch for DIN (top-hat) rail mounting. 5x RJ45 port with 100 MBit/s (1x uplink, 4x PoE+ with max. 75 W). Supply: 48 V DC, max. 75 W. Simplified cabling for door stations due to available connectivity for anti-theft protection, door opener and MxBus. MxBus, anti-theft protection, door and lock contact can be connected via	All cameras.	Plastic housing, gray	0.31 kg

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
	separate wires of Ethernet cable.			

Further Reading

Manuals and Quick Installation documents

Video Analytics Manual

Technical Specifications

MOBOTIX MOVE Installation Hints

MOBOTIX Community

MOBOTIX

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