Technical Specifications

MOBOTIX MOVE 2MP Vandal Bullet ALPR Camera

Performant 2MP, Full HD/1080p resolution ALPR (Automatic License Plate Recognition) cameras with integrated high-performance ALPR/OCR engine. The MOBOTIX MOVE Mx-VB1A-2-IR(-D)-ALPR camera extends the existing range of MOVE IP cameras with advanced ALPR features and MMC (make, model, color) vehicle classification "on board". 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.

- Vaxtor ALPR-ready for all vehicle speeds and stop-and-go applications (license required)
- Automatic license plate recognition for all vehicle speeds and stop-and-go applications
- 64 GB SD card pre-installed
- EverClear coating of front glass
- **Mx-VB1A-2-IR-ALPR**: Motorized Vari-Focal Lens 2.7 to 12 mm, F1.6 to F2.9, Zoom, Focus, One-Push AF
- **Mx-VB1A-2-IR-D-ALPR**: Motorized Zoom Lens 9 to 22 mm, F1.6 to F2.4, Zoom, Focus, One-Push AF

- Wide Dynamic Range (WDR) max. 130 dB
- Integrated IR LEDs up to 50 m/164 ft distance visual, 20 m/66 ft for ALPR
- ONVIF Profile S/G/T/M support
- Triple power support (IEEE802.3bt/AC24V/DC24V)
- Temperature Range –55 to 60 °C/-67 to 140 °F with integrated heater ON
- IP66, IP67 and IK10
- Easily integrated into many common VMS solutions

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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	2MP Vandal Bullet ALPR Camera
Order Code	Mx-VB1A-2-IR(-D)-ALPR

Hardware Design

Processor	Ambarella CV22 (Quad-core ARM® Cortex®-A53, 1 GHz)
Memory	RAM: 1 GB FLASH: 256 MB
Image Sensor	2MP, 1/2.8" Progressive CMOS IMX462 (SONY STARVIS)
Effective (Used) Pixels	1920x1080 (2MP)

Lens

Minimum Illumination	Color: 0.02 lux B/W: 0.001 lux
Lens Characteristics	**Mx-VB1A-2-IR-ALPR**: Motorized Lens: Zoom, Focus, P-IRIS Focal Length: 2.7 to 12 mm Aperture: F1.6 to F2.9 Horizontal Field of View: 102.1° (Wide), 31.5° (Tele) Vertical Field of View: 70.3° (Wide), 22.7° (Tele) **Mx-VB1A-2-IR-D-ALPR**: Motorized Lens: Zoom, Focus Focal Length: 9 to 22 mm Aperture: F1.6 to F2.4 Horizontal Field of View: 36.1° (Wide), 15.4° (Tele)

	Vertical Field of View: 19.8° (Wide), 8.8° (Tele)
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	Automatic mechanically switchable IR-cut filter
Shutter Speed	Up to 1/43040 s
Frame Rate (maximum)	H.265/H.264: 1920x1080@30 fps + 720x480@30fps MJPEG: 1080p@30fps
Auto Gain	Min. gain: 3 dB, max. gain: 48 dB, step size: 3
WDR	Up to 130 dB Multi Exposure WDR & HDR Engine support
Zoom	Optical zoom, digital zoom ready by lens type
Image settings	Color, Brightness, Sharpness, Contrast, White Balance, Exposure Control, 2DNR, 3DNR, NR by Motion, Masking, Text Overlay
Corridor Mode	90°, 180°, 270° Rotation

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	2-Way, bidirectional

Audio Input	Line In: Max 6.2 Vpp Signal In, Input Impedance: 33 kΩ
Audio Output	Line Out: 1 Vrms Signal Out, Output Resistance: 200 Ω

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)

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
ONVIF conformance	Supports profiles S/G/T/M
Supported Browsers	All current browsers are supported.

ALPR (Automatic License Plate Recognition) Features

NOTE! Formatted 64 GB SD card is pre-installed! For replacement cards, using a 64 GB or larger SD card is recommended. See **MicroSD Cards for MOBOTIX MOVE Cameras** document on **www.mobotix.com > Support > Download Center > Marketing & Documentation > White Lists**.

NOTE! Additional Vaxtor ALPR License Activation key required (available from Vaxtor).

Operational Range	- Monitors 1 or 2 lanes **Mx-VB1A-2-IR-ALPR**: - Reading distance up to 18 m/59 ft - Effective IR distance up to 20 m/66 ft - Recommended speed range from 0 to 60 km/h/37.3 mph - Suitable for low-speed scenarios: parking, Smart City traffic, etc. **Mx-VB1A-2-IR-D-ALPR**: - Reading distance up to 35 m/115 ft - Effective IR distance up to 35 m/115 ft - Recommended speed range from 0 to 160 km/h/99.4 mph (up to 200 km/h/124.3 mph) - Suitable for low-speed to high-speed scenarios: parking, Smart City traffic, urban traffic, highway traffic, etc. - Min. to max. characters height: 14 to 70 pixels. - Operates under extreme conditions such as low lighting, shadows, overexposed/damaged/dirty plates - Operates in bad weather and with extreme angles while maintaining high-accuracy readings
Vaxtor ALPR Vaxtor Machine/Deep Learning Engine MOBOTIX ALPR MOBOTIX Machine/Deep Learning Engine	- Full support of over a hundred countries (full list available upon request) - High-performance DNN-based OCR engine for selected countries (full list available upon request) - Support of Latin, Arabic, and Thai alphabets, GCC members, and enhanced North America state recognition

	▪ Min. to max. characters height: 13 to 70 pixels (recommended 25 to 30)
	▪ Max. rotation X (pitch) vertical angle ±60° (max ±25° for optimal performance)
	▪ Max. rotation Y (yaw) horizontal angle ±65° (max ±25° for optimal performance)
	▪ Max. rotation Z (roll) ±35° (max ±10° for optimal performance)
	▪ Vehicle category, make, model, and color classification
	▪ Direction of travel reporting/filtering
	▪ Achieves >99% accuracy (several third-party independent assessments)
Results Integration	▪ Both push and pull modes supported (API available)
	▪ Generic HTTP XML/2x JSON
	▪ TCP/IP proprietary protocol (open)
	▪ UTMC
	▪ FTP
	▪ TCP server
	▪ Branded SW/VMS integration: MOBOTIX HUB, Genetec Security Center, Milestone XProtect, Axis Camera Station, Helix, Network Optix, among others.
	▪ Branded HW integration: MOBOTIX MOVE NVRs.
Additional Features	▪ Failover capabilities for transmission of results
	▪ Embedded whitelist/blacklist management
	▪ Video overlay
	▪ Customizable local relay triggering
	▪ Free-flow or signaled modes
	▪ 64 GB SD card pre-installed

System Integration

Base Video Analytics	- Motion detection - Audio detection
Event Triggers	- External input - Analytics - Network failure detection - Periodical event - Manual trigger - MxMessageSystem messages
Event Actions	- External output activation - Video and audio recording to edge storage - File upload: FTP, network share and email - Notification: HTTP, FTP, email - MxMessageSystem messages

General

Housing Materials	Metal Back Housing, PC Front
Housing Color	RAL 9003
Device Color	PC front cover: RAL9003 Sunshield: - Logo color: Pantone 286C and Pantone Gray 6 Cu - Body color: RAL9003 - Back metal body: RAL9003
Power Requirements	PoE IEEE802.3af, class 0, max 12.95 W DC12V, max 15.59 W AC24V, max 13.31 W, max 25.08 VA
PoE Modes Supported	Mode A or Mode B
Connectors	RJ45, Alarm in x2, Alarm out x1, Audio in, Audio out terminal block,

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	DC12V/AC24V terminal block, CVBS Connector COAX (75 Ohm) (CVBS output available with max. 2 activated streams)
IR Illumination	850 nm; up to 50 m/164 ft distance depending on reflection of scenery (visual), 20 m/66 ft for ALPR
Video Storage	Micro SD/SDHC/SDXC card support up to 1 TB, Support for recording to NAS, MOBOTIX HUB, MOBOTIX MOVE NVR
SD Card pre-installed	64 GB
Environmental Protection Class	IP66, IP67 and IK10
Operating Temperature	–55 to 60 °C/-67 to 140 °F with integrated heater ON
Cold Start Temperature	–30 °C/–22 °F
Relative Humidity	90 % non-condensing
Storage Conditions	–20 to 70 °C/–4 to 158 °F
Approvals	EMC: CE, FCC, BIS Safety: LVD Environmental: IP66, IP67, IK10
MTBF	95,000 hours
Warranty	5 years
Dimensions	ø 105x232 mm
Weight	1280 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
3.3 V with 10 kΩ pull up, 50 mA	350 V DC/AC, 130 mA

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!
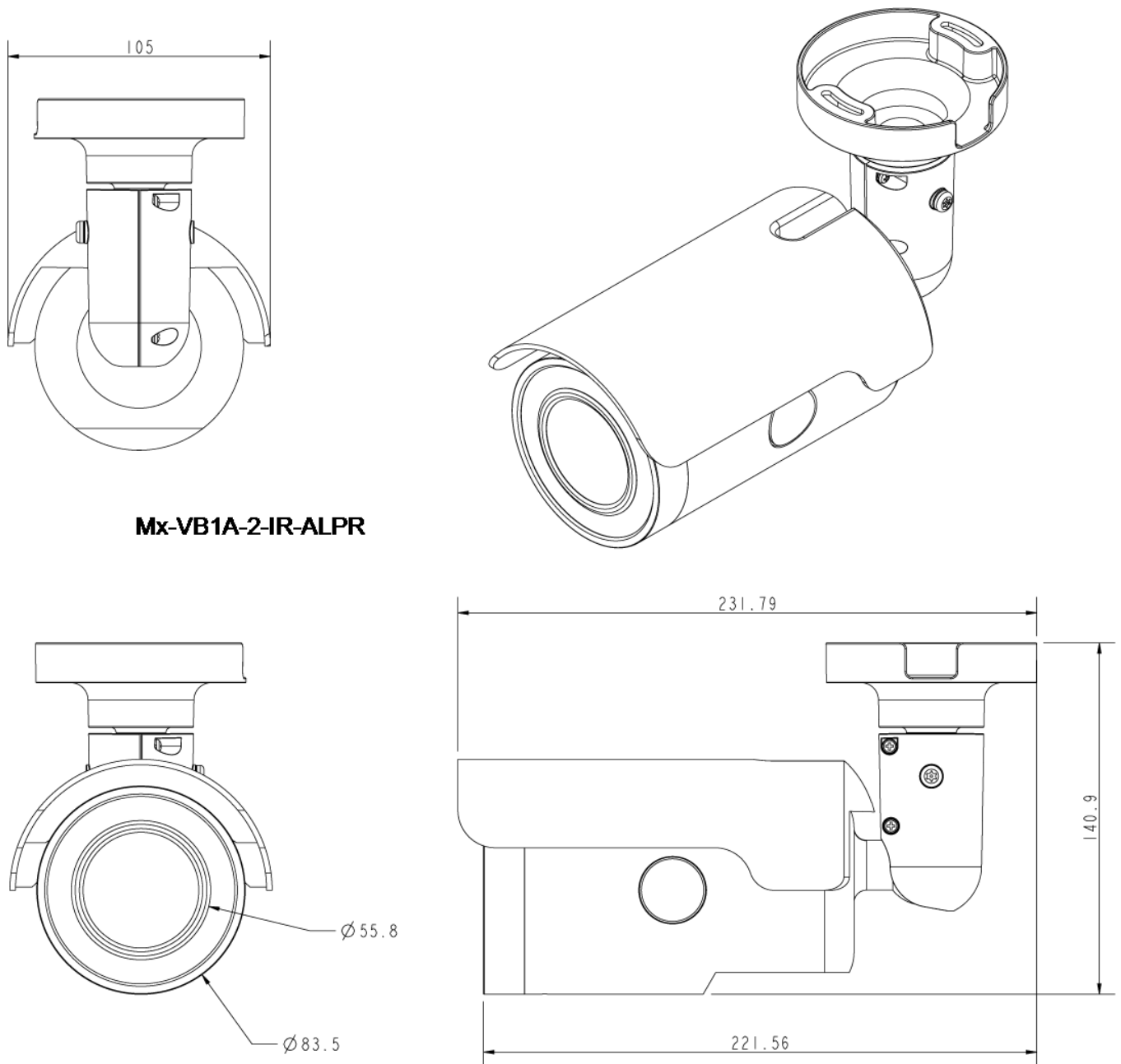
Mx-VB1A-2-IR-ALPR

Fig. 1: Mx-VB1A-2-IR-ALPR: All measurements in mm

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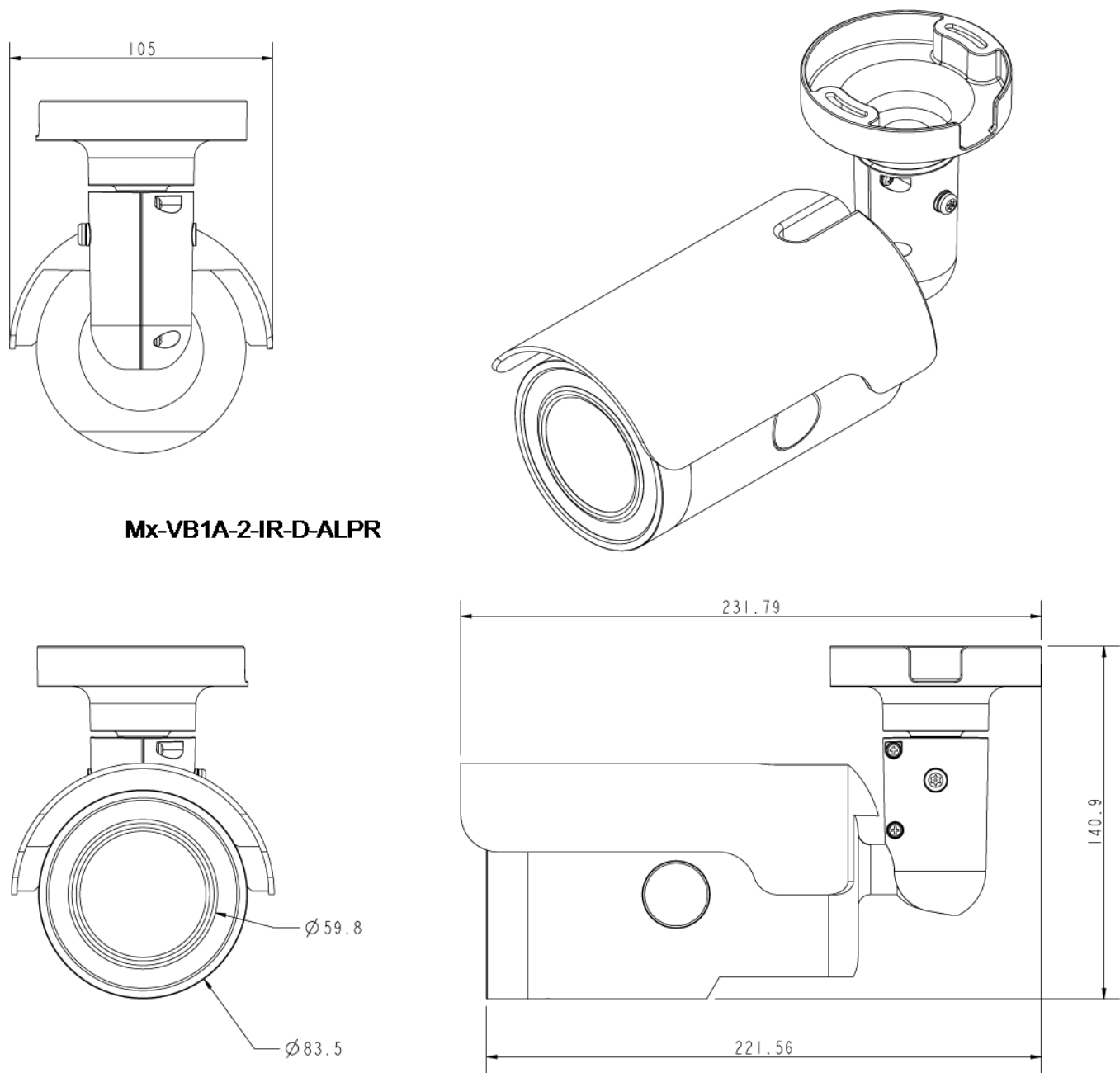
MOBOTIX MOVE 2MP Vandal Bullet ALPR Camera

105

Mx-VB1A-2-IR-D-ALPR

Ø 59.8

Ø 83.5

231.79

140.9

221.56

Fig. 2: Mx-VB1A-2-IR-D-ALPR: All measurements in mm
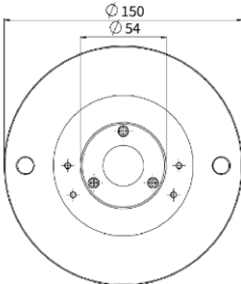
Accessories for Bullet Cameras
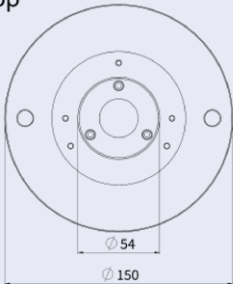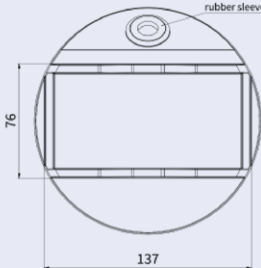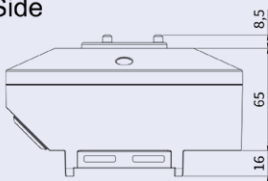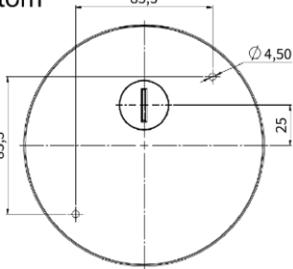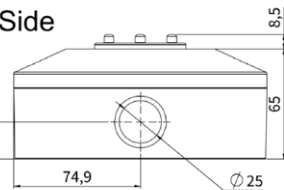
Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
  Mx-M-BC-P	Weatherproof pole mount for MOVE Bullet cameras (IP66, IP67).	All MOVE Bullet cameras except Mx-BC1A-2-IR.	Die-cast ADC12 aluminium alloy, hammer blow-painted RAL9003	1.0 kg
  Mx-M-BC-W	Weatherproof wall mount for MOVE Bullet cameras (IP66, IP67).	All MOVE Bullet cameras except Mx-BC1A-2-IR.	Die-cast ADC12 aluminium alloy, hammer blow-painted RAL9003	0.84 kg
  Mx-A-VB-FGK-EC	**EverClear-coated** front glass for MOVE2, 5, and 8 MP Vandal Bullet cameras.	All MOVE Vandal Bullet (VB) cameras **from Nov. 2021**.	Aluminum, glass, rubber	0.033 kg

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
Mx-A-VB1A-2-IR-ALPR-FGK-EC	**EverClear-coated** front glass for MOVE 2MP ALPR cameras.	MOVE 2MP ALPR camera Mx-VB1A-2-IR-ALPR.	Aluminum, glass, rubber	0.033 kg
Mx-A-VB1A-2-IR-**D**-ALPR-FGK-EC	**EverClear-coated** front glass for MOVE 2MP ALPR (**D variant**) cameras.	MOVE 2MP ALPR camera Mx-VB1A-2-IR-**D**-ALPR.	Aluminum, glass, rubber	0.033 kg

Dimensions

Order Code	Dimensions
Mx-M-BC-P	
Mx-M-BC-W	

All measurements in mm.

Accessories for All Cameras

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
MX-NPA-UPOE1A-60W	UPoE Power Injector 60W. PoE++ 60W Network Power injector • 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• Supports 10/100/1000Base-T applications.	All cameras.	Plastic housing, black	0.45 kg
Mx-A-ETP1A-2601-SET	Media converter set Ethernet (PoE+) – Twisted-Pair. Complete set consisting of two two-wire transmit/receive units for establishing an Ethernet transmission path via twisted-pair cables. • Transmission of Ethernet and PoE+ power supply via two-wire line according to IEEE1901. • Simple connection of 10/100 Mbps Ethernet end devices • Max. 95 Mbps transmission	All cameras. Requires Mx-A-ETP1A-2601-POW.	Plastic housing, black	0.368 kg

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
	bandwidth, range up to 600 m/656 yd for data only, 300 m/328 yd for PoE depending on the quality of the twisted-pair link • 128 bit AES network data encryption • Power supply 2-wire transmitter (Tx) and receiver (Rx) as well as end device via PoE+ network switch or external power supply 56VDC / 1.2A (not included!) • Connected end devices are supplied via PoE switch IEEE802.3af(PoE), IEEE802.3at (PoE+), UPoE up to 60W (requires ext. power supply unit). • Status LEDs (data, power supply, data link, PoE) • Integrated Overvoltage protection (IEC 61000-4-5 4kV (1.2 / 50us), 2kA(8 / 20us)) • Power Supply: TX: T-Linx or DC12V~57V, RX: PoE Switch or DC48V~57V • Operational temperature: -20 to 60°C • Dimensions: 80.4(L) x 61.6(W) x 24(H)mm • Weight: RX/TX: 102g • Warranty: 2 years			

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
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
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

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
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 separate wires of Ethernet cable.	All cameras.	Plastic housing, gray	0.31 kg

Further Reading

Manuals and Quick Installation documents

Technical Specifications

MOBOTIX MOVE Installation Hints

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