Technical Specifications

MOBOTIX MOVE 2MP Vandal Bullet ALPR Camera

Performant 2MP 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.

- 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 60 m/197 ft distance visual, 20 m/35 m (66 ft/115 ft) effective 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 heater
- 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: 512 MBytes FLASH: 256 MBytes
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

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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**.

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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

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.

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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, DC12V/AC24V terminal block, CVBS Connector COAX (75 Ohm) (CVBS output available with max. 2 activated streams)
IR Illumination	Visual up to 60 m/197 ft distance depending on scenery reflection
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 heater
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 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

Accessories

Picture	Order Code	Description
	Mx-M-BC-P	Pole Mount (junction mount) for MOBOTIX MOVE Bullet cameras
	Mx-M-BC-W	Wall Mount (junction mount) for MOBOTIX MOVE Bullet cameras
	Mx-NPA-UPOE1A-60W	UPoE Network Power Injector 60 W
	Mx-A-ETP1A-2601-SET	Media Converter Set Ethernet (PoE+) – Twisted-Pair

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!
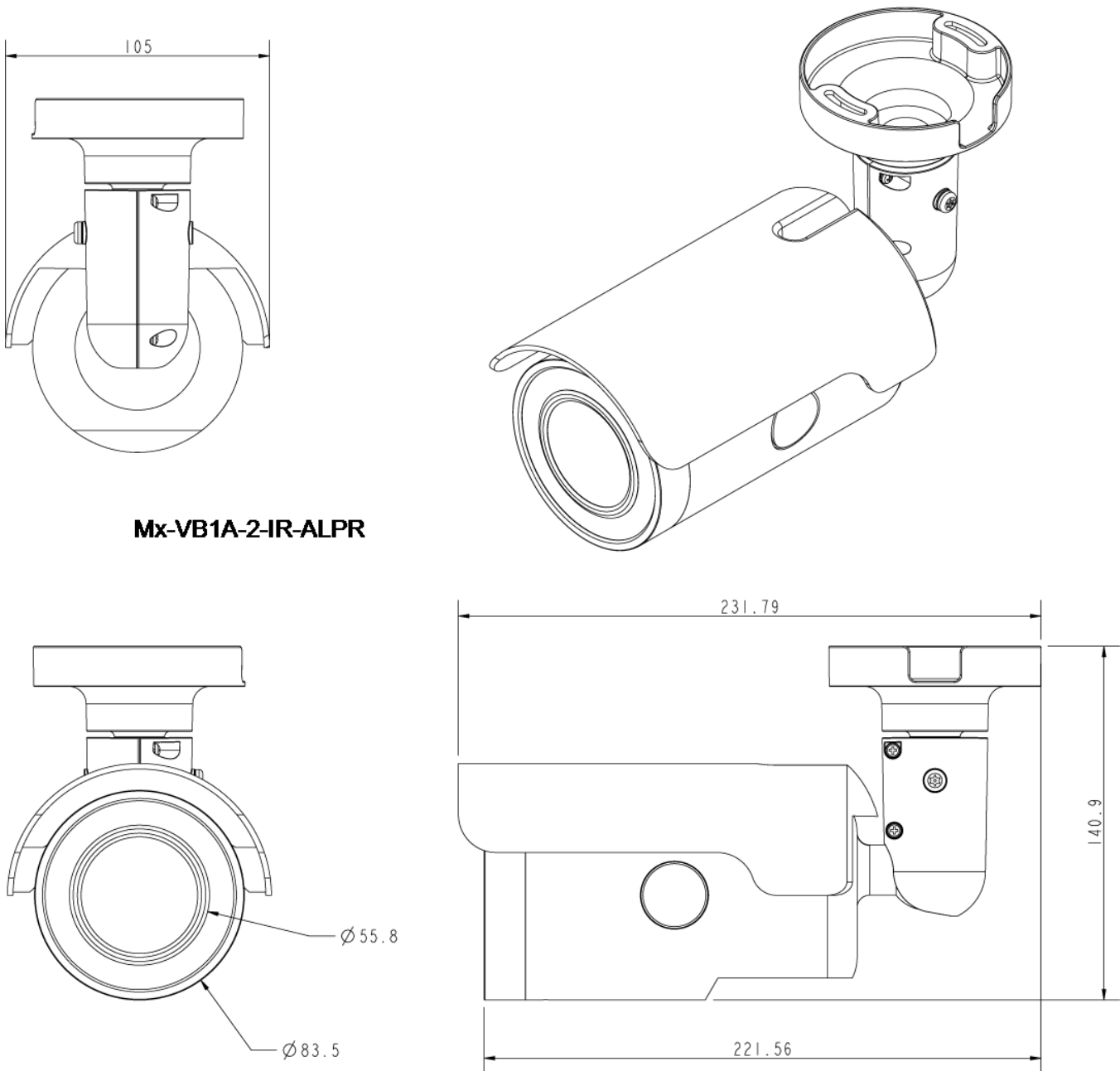
Mx-VB1A-2-IR-ALPR

Fig. 1: Mx-VB1A-2-IR-ALPR: All measurements in mm
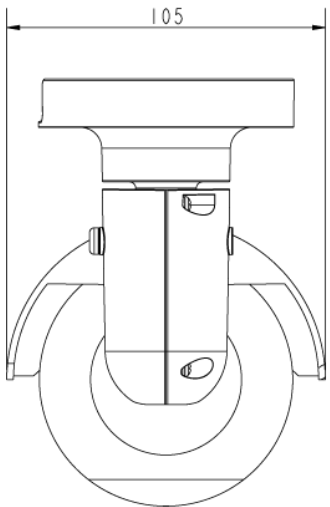
Mx-VB1A-2-IR-D-ALPR
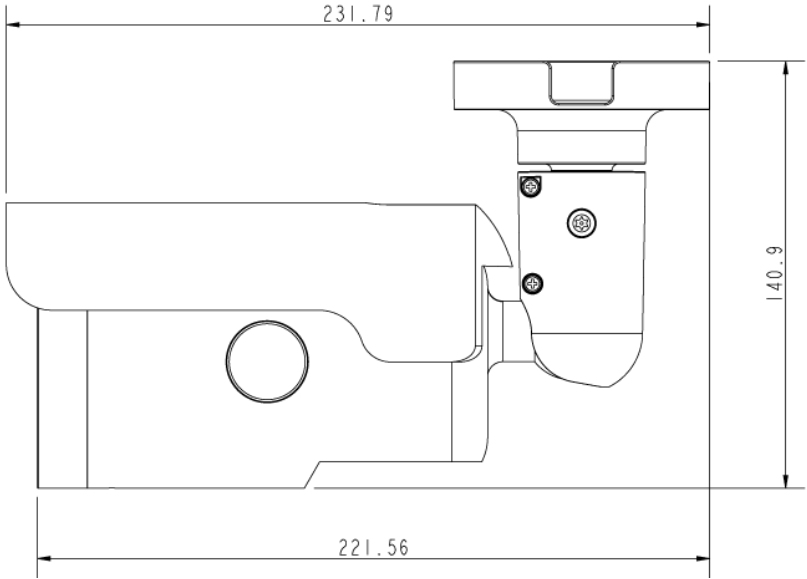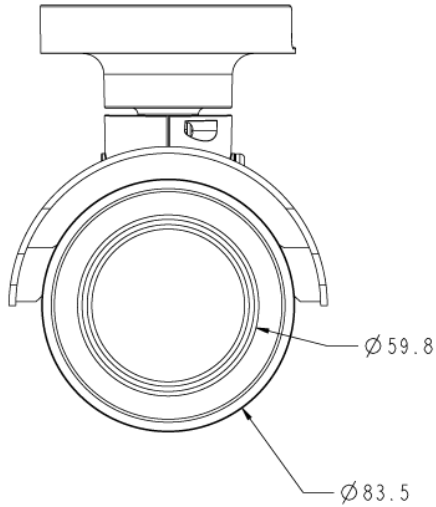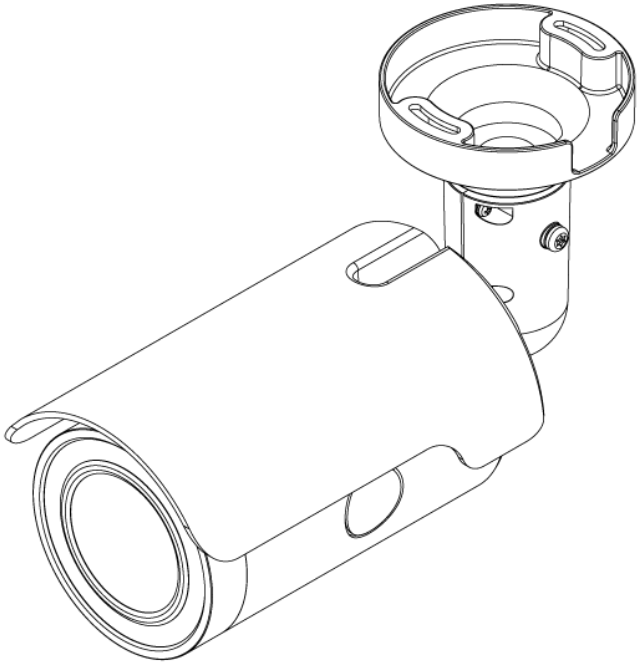
Fig. 2: 2MP Vandal Bullet ALPR Camera: All measurements in mm

Further Reading

Manuals and Quick Installation documents

Technical Specifications

MOBOTIX MOVE Installation Hints

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