

Technical Specifications

MOBOTIX MOVE 2MP Low-Light Flush-Mount Video Analytics Speed Dome

Supported by high-performance DNN processor/SoC in combination with state-of-the-art CMOS video sensor, the indoor MOBOTIX MOVE 2MP Low-Light Flush-Mount Video Analytics Speed Dome is much more than just standard, providing crisp, noise-free and smooth video streaming at full HD 2MP resolution even under extreme 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.

- High light sensitivity: 0.01 Lux color, 0.001 Lux B/W
- 30x motorized zoom/focus lens 4.3 to 129 mm
- WDR up to 130 dB
- Quad streaming H.264/H.265/MJPEG
- Intelligent encoding, smart lowbitrate 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 (IEEE802.3at/AC24V)
- Temp. Range -40 to 55 °C/-40 to 131 °F







Beyond **Human Vision**

MOBOTIX MOVE

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High-Quality DNN Edge Video Analytics



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.

Product Information

Product Name	2MP Low-Light Flush-Mount Video Analytics Speed Dome
Order Code	Mx-SD2A-230-LL-FM-VA

Hardware Design

Processor	Ambarella CV25 (Quad-core ARM® Cortex®-A53, 1 GHz)
Memory	RAM: 512 MB
	FLASH: 256 MB
Image Sensor	2MP, 1/2.8" Progressive CMOS IMX662 (SONY STARVIS 2)
Effective (Used) Pixels	1920x1080 (2MP)

Lens

Minimum Illumination	Color: 0.01 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: 4.3 to 129 mm Aperture: F1.6 – F4.7 Horizontal Field of View: 59.3° (Wide), 2.3° (Tele) Vertical Field of View: 34.9° (Wide), 1.4° (Tele)

Camera

Shutter Speed (Auto)	1 to 1/10000 s
Shutter Speed (Manual)	WDR: 1/37500 s Linear: 1/75000 s
Shutter Priority Mode	Up to 1/45 s
Frame Rate (maximum)	WDR on/off: H.265/H.264: 2MP@30 fps MJPEG: 1080p@30 fps
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: 30x, 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	-10° to +100°
Pan Speed	Manual Pan Speed: 0.1°–90°/s Preset Pan Speed: 400°/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 $k\Omega$
Audio Output	Line Out

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

System Integration

Base Video Analytics	Motion detectionAudio detection
DNN-Based Video Analytics (linkable to PTZ presets)	Abandoned objects
	Intrusion (object classification/filtering for people, vehicles, etc.)

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- 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
- 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 and plastic	
Housing Color	RAL 9003	
Power Requirements	PoE+ IEEE802.3at, class 4, max 17.71 watt	
	AC24V, max 17.10 watt, max 32.67 VA	
PoE Modes Supported	Mode A or Mode B	
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)	
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	
Operating Temperature	–40 to 55 °C/-40 to 131 °F	
Relative Humidity	90 % non-condensing	
Storage Conditions	–20 to 70 °C/–4 to 158 °F	
Approvals	EMC: CE, FCC, BIS	
	Safety: LVD	
MTBF	50,000 hours	
Warranty	5 years; mechanically wearable parts (motor, gears, belts, etc.) excluded	
Dimensions	ø 212 x 264 mm (overall)	
	ø 212 x 103 mm (visible)	
Weight	2700 g	

NOTE! Observe the <u>MOBOTIX MOVE Installation Hints</u> document to ensure optimum performance of the camera features.

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Alarm Input/Output Current and Voltage

Alarm In	Alarm Out
5 V with 10 k Ω 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	Ove	rview	Ou	tline	Di	scern	Pe	rceive	Chara	cterize	Va	lidate	Scrı	ıtinize
Level														
Cam-	Wide-Angle	Tele	Wide-Angle	Tele	Wide-Angle	Tele	Wide-Angle	Tele	Wide-Angle	Tele	Wide-Angle	Tele	Wide-Angle	Tele
era	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$	⇔/\$
Mx-	85 m/85 m	2291 m/2210 m	42 m/43 m	1146 m/1105 m	21 m/21 m	573 m/552 m	14 m/14 m	367 m/354 m	7 m/7 m	183 m/177 m	3 m/3 m	92 m/88 m	1 m/1 m	31 m/29 m
SD2A-	278.87 ft/278.8-	7516.40 ft/7250.6-	137.80 ft/141.0-	3759.84 ft/3625.3-	68.90 ft/68.90-	1879.92 ft/1811.0-	45.93 ft/45.93-	1204.07 ft/1161.4-	22.97 ft/22.97-	600.39 ft/580.7-	9.84 ft/9.84-	301.84 ft/288.7-	3.28 ft/3.28-	101.71 ft/95.14-
230-LL-	7 ft	6 ft	8 ft	3 ft	ft	2 ft	ft	2 ft	ft	1 ft	ft	1 ft	ft	ft
FM-VA														

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!

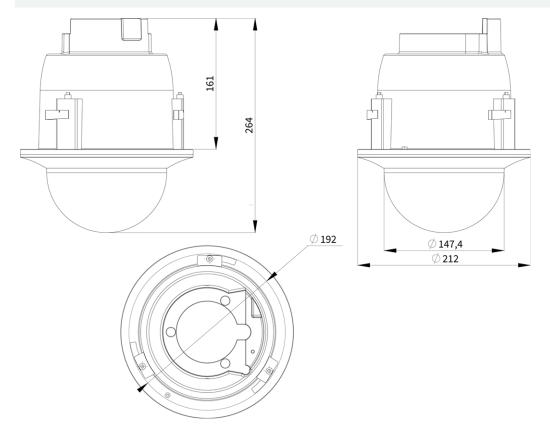


Fig. 1: Mx-SD2A-230-LL-FM-VA: All measurements in mm

Accessories for Speed Dome Cameras

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
	•	Mx-M-SD-W or Mx-M-SD-WL.	SPCC steel, ham- mer-blow	- 2.17 kg
		CAUTION! Cannot be used with MX-M-SD-WM or Mx-M-SD-WMJB!	painted RAL9003	
Mx-M-SD-C				
	Weatherproof pole mount.	Mx-M-SD-W or $Mx-M-SD-WL$.	Zinc-galvanized SECC steel,	1.58 kg
		CAUTION! Cannot be used with MX-M-SD-WM or Mx-M-SD-WMJB!	powder-coated RAL9003	
• 1				
Mx-M-SD-P				

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

Picture/ Order Code	Description	Compatible Products	Material/ Color	Weight
		AP).		
	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 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 ADC12 aluminium alloy, RAL9003	1.3 kg
MX-M-SD-WM		NOTE! Can be combined with MX-M-SD-WMJB (wall mount is mounted on top of junction box).		
	mount junction box	All MOVE Speed Dome/Vandal Turret cameras.	Bracket: Steel, powder-coated RAL9003 Junction box: Die-cast ADC12 aluminium alloy, RAL9003	4.8 kg
MX-M-SD-WMJB		CAUTION! Only to be used as base for Mx-M-SD-WM (wall mount is mounted on top of junction box).		

Picture/ **Order Code**



Description

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.

Compatible **Products**

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).

Material/ Weight Color

Die-cast ADC10 1.58 kg aluminium alloy, powdercoated RAL9003

MX-M-SD-PM



MX-M-SD-PMEXT

Extension pipe 25 cm/10 in for MX-M- PM; max. extended SD-PM.

Extends MX-M-SDtotal length is 1 m/39 in (3 extensions).

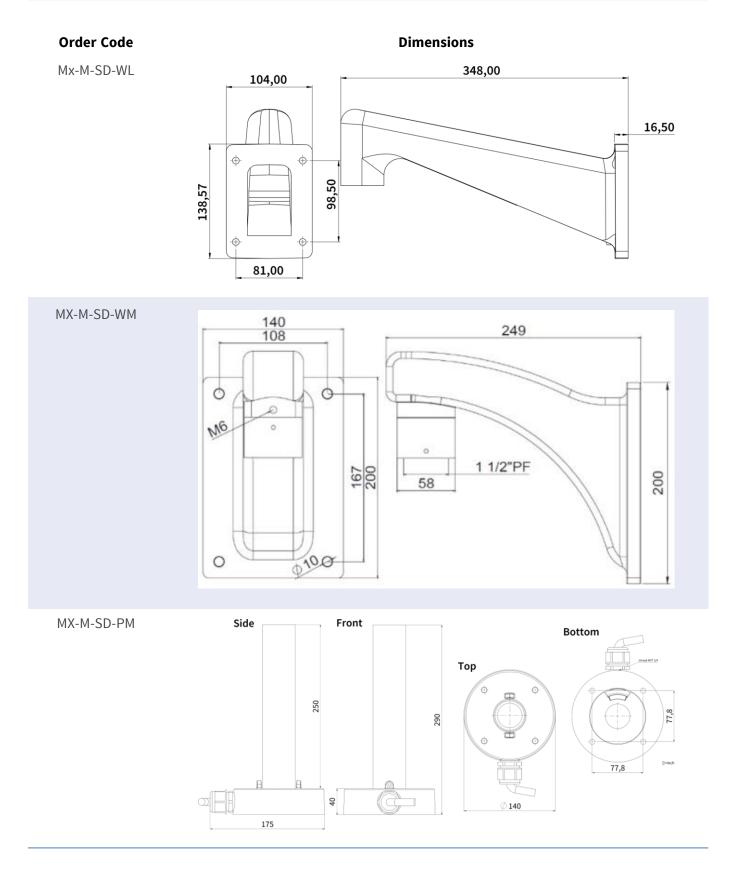
Die-cast ADC10 0.8 kg aluminium alloy, powdercoated RAL9003

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 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).	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 alu- minium alloy, powder-coated RAL9003 Dome: Polycar- bonate, tinted	0.3 kg
	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 alu- minium alloy, powder-coated RAL9003 Dome: Polycar- bonate, clear	0.3 kg
Mx-A-SD-DCT				

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 alu- minium alloy, powder-coated RAL9003 Dome: Polycar- bonate, clear	0.58 kg
MOBOTIX EVEL C. E. S.	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 alu- minium alloy, powder-coated RAL9003 Dome: Polycar- bonate, tinted	0.58 kg
MX-A-SD-DBT-EC				

Dimensions

Order Code Dimensions Mx-M-SD-C 6x Ø 8,50 Front Side 222 Mx-M-SD-P **Bottom** 133 Front 170 Top 33,50 125 09 65 92 129° 4x ∅4 Side 2x Ø 2,50 270 34 12x Ø 7,50 Mx-M-SD-W воттом ТОР []=Inch



Order Code Dimensions MX-M-SD-PMEXT 250 MX-M-SD-GN 519 255,5 256

MX-M-SD-WMJB FRONT SIDE SIDE 108 210 256

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: • -10° to 40°C @60W • -10° to 50°C, 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 hous- ing, 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 depend-			
	ing on the quality of the twis-			
	ted-pair link • 128 bit AES			
	network data encryption •			
	Power supply 2-wire trans-			
	mitter (Tx) and receiver (Rx)			
	as well as end device via			
	PoE+ network switch or			
	external power supply 56VDC			
	/ 1.2A (not included!) • Con-			
	nected end devices are sup-			
	plied 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 hous- ing, 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	All cameras. Requires Windows or macOS computer with USB 2.0 or better.	Plastic hous- ing, black	1.9 kg

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.

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 pro-		Plastic hous- ing, gray	0.31 kg
	tection, door and lock contact can be connected via separate wires of Ethernet cable.			

Further Reading



