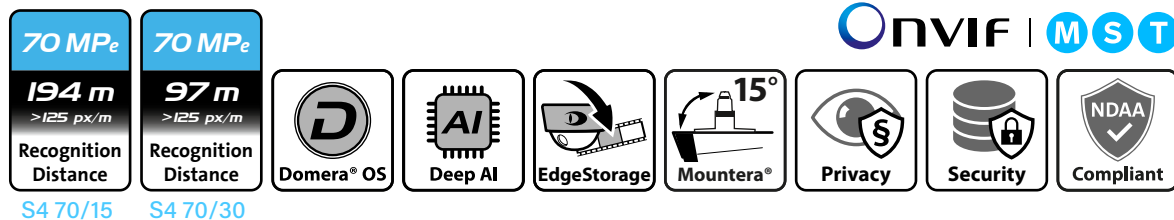


Panomera® S4 Ultraline Area Series

MK2

Multifocal Sensor System, 30 fps, H.265, day/night, UWDR, Deep AI object classification, EdgeAnalytics AI Apps, variable Mountera® mounting system



The patented Panomera® Multifocal Sensor System is a completely new camera technology particularly developed for the extensive video surveillance of large scale areas. Enormous expanses and areas are captured in a completely new resolution quality in real time. This results in significantly lower infrastructure requirements. Where previously several megapixel cameras would have been necessary, a single Panomera® Multifocal Sensor System is now sufficient.

Panomera® effect

The sophisticated combination of the high-resolution sensors of Panomera® S4 Ultraline offers an excellent dynamic range of 130 dB UWDR effectively and results in an extreme Panomera® effect. It offers a resolution of more than 125 px/m up to a distance of 194 or 97 m, which enables the recognition of persons over the entire distance. The identification of persons (250 px/m) is supported up to a distance of 97 m depending on the model.

Domera® OS

The sensors of the Panomera® are equipped with the hardened Linux operating system Domera® OS (D-OS). In addition to a kernel with long-term support, it offers extensive security functions such as the deactivation of unused ports or the enforcement of strict passwords. In addition, Domera® OS supports secure network authentication (IEEE 802.1X) and encrypted data transmission (TLS 1.3/AES-256). All software components are subject to permanent monitoring, maintenance and updating, while the effectiveness of all measures is ensured by regular external penetration tests.

AI Analysis - Deep AI Object Classification

The Panomera® is equipped with an intensively trained neural network that analyzes the captured images in high resolution and independent of movements in the background (green spaces, water areas, etc.) and reliably classifies defined objects (persons, vehicles, etc.) in real time. The captured data is sent with the video stream to the Dallmeier recording system for evaluation and storage and is available for further processing with the integrated EdgeAnalytics Apps.

AI Analysis - EdgeAnalytics Apps

The embedded EdgeAnalytics AI apps use the raw data of the Deep AI Object Classification to assess the captured operations according to the specific criteria of various use cases. The Line Crossing App, for example, detects the crossing of a defined line by a relevant object (person, vehicle, etc.) and generates a corresponding message with time and direction of movement. The generated event messages and values complete the raw data already contained in the video stream and can be displayed and evaluated with a Dallmeier client software.

AI Analysis - Configuration

The embedded EdgeAnalytics AI apps are configured directly on the individual modules, with the analysis results being merged on the master module for transmission to the recording system. The master configuration will be integrated with one of the next updates of Domera® OS. This convenience feature allows cross-module configuration of the analyses on the master module and provides continuous object tracking across module boundaries.

Permanent capturing

The multifocal sensor system captures and stores all areas of the object space in maximum detail resolution. It does not matter whether the operators in live mode concentrate on a certain area (multiple detail zoom) or whether interesting areas are displayed in detail on the basis of video content analysis (multiple auto tracking). The Panomera® recordings always contain the entire action and allow for the evaluation of each incident.

Further features

- GDPR-compliant functions for data protection and security
- Compatible with ONVIF Profile M, Profile S and Profile T
- Weather-proof (IP69) housing with integrated heater
- Housing coating tested for seawater resistance
- Fully compatible with the Mountera® Quick-Lock System
- Network protocol MQTT supported

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Optional EdgeAnalytics AI Essential Apps



The **AI Motion Detection App** analyzes the entire image content and reliably detects all movements triggered by persons or vehicles. The motion events are sent to the recording system with the video stream. Afterwards, they are available with metadata such as object type, time and position for targeted evaluation with Dallmeier client software.



The **AI Tamper Detection App** is classically used for detecting and reporting attempted tampering with the camera. The app detects a general change in the captured scene, such as typically occurs when the camera is manually rotated or tilted, and immediately issues a corresponding message.



The **AI Loitering Detection App** analyzes the movement of persons detected by the neural networks and evaluates their dwell time in a defined sensitive zone. If the set limit value of the dwell time is exceeded, a corresponding message can be displayed to the operator. At the same time, undesired attendants can be requested to leave the area by outputting a stored audio sequence.



The **AI Intrusion Detection App** allows the definition of protected zones and issues a message as soon as an object intrudes into them. The object type relevant for the message can be defined as, for example, person or vehicle. For targeted operator attention, a pre-zone can be defined for each protected zone, which can be used to escalate the messages.



The **AI Line Crossing App** issues a message as soon as a person or vehicle crosses a virtual line drawn in the image. Uninteresting crossings of the virtual lines, for example by animals, can be effectively excluded. An operator is thus less distracted and can concentrate much better on relevant observations.



The **AI Vehicle Parking App** enables the definition of several zones in which vehicles may not be parked for a longer period of time. The permitted parking time can be set globally for all zones between 5 and 3600 seconds. If this time is exceeded, a corresponding message is sent to the client indicating that the vehicle has been parked incorrectly.

Optional EdgeAnalytics AI Apps



The optional **AI High Resolution Counting App** and the underlying AI High Resolution Counting neural network were developed for the direct counting of people and vehicles in large crowds (up to 2000 people or vehicles). Typical use cases include counting people in airport waiting areas or counting vehicles in large parking lots.



The optional **AI Perimeter App** allows the definition of particularly protected areas (sterile zone) and issues an alarm message as soon as an object intrudes them. In conjunction with the neural network specially trained for perimeter protection, even attacks by well-prepared groups of perpetrators who use unusual forms of movement or camouflage clothing can be reliably alerted. The included **AI Extended Tamper Detection App** is used for detecting and reporting attempted tampering with the camera.

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Panomera® S4 70/15 DN Ultraline



009205

Panomera® S4 70/15 DN

Multifocal sensor system, 70 MPe, 30 fps, H.265, day/night, UWDR, Deep AI object classification, EdgeAnalytics AI Apps, field of view horizontal 15°, resolution 125 px/m up to 194 m, Mountera® mounting system, 1000BASE-T Ethernet port for copper cabling

Panomera® S4 70/30 DN Ultraline



009206

Panomera® S4 70/30 DN

Multifocal sensor system, 70 MPe, 30 fps, H.265, day/night, UWDR, Deep AI object classification, EdgeAnalytics AI Apps, field of view horizontal 30°, resolution 125 px/m up to 97 m, Mountera® mounting system, 1000BASE-T Ethernet port for copper cabling

Accessories



007054

Mountera® Box with PSU

Mountera® Box with power supply unit, 48 V DC, 5.4 A, 260 W, IP69, white



009446

Mountera® Box with SRS Edge

Mountera Box® with SeMSy® Recording Server, recording of up to 16x video streams (1x included), total bit rate up to 140 Mbps, fanless, energy efficient, power supply unit 48 V DC, 5.4 A, 260 W included, IP69, white, without SSD memory module¹⁾



006979

Mountera® Wall Bracket

Mountera® bracket for the installation of camera systems on walls or on a Mountera® Box, Quick-Lock System included, robust aluminium construction, internal cable routing, vandal-resistant, powder-coated, white



006980

Mountera® Ceiling Bracket

Mountera® bracket for installation of camera systems on ceilings, Quick-Lock System included, robust aluminium construction, internal cable routing, vandal-resistant, powder-coated, white

Sunshield



009252

Panomera® Sunshield

Sunshield for Panomera® S 4 and S8 models with Mountera® housing, aluminium, white with black front panel

Cable Set



007428

Mountera® Cable Set C

Preassembled cable set for the connection of a camera system to a Mountera® Box, 1x cable seal, 1x cable power supply/grounding, 1x cable network (copper RJ45), each with matching plug, UV-resistant and flexible, length 80 cm

¹⁾ The M.2 SSD memory module is installed at the factory and must be ordered with the appliance. Subsequent installation or replacement is not possible.

Multifocal Sensor System, 30 fps, H.265, day/night, UWDR, Deep AI object classification, EdgeAnalytics AI Apps, variable Mountera® mounting system

Included Support and License Interval	
Panomera® S/W 4 Support and License Interval Basic License for the use of the support services of the Support Level Basic for 60 months, license for the update of Domera® OS with updates, upgrades and security updates ²⁾ for 60 months, license for the update of neural networks for object classification for 60 months, test function of the EdgeAnalytics AI Apps (Essentials) with object classification with a runtime of 30 days, unlimited license for the use of the VCA function, bring-in warranty for 24 months	
Optional Support and License Interval	
009220	AI Panomera® S/W 4 Support and License Interval Premium and Warranty (Total of 60 Months) License for the use of the support services of the Support Level Premium for 60 months unlimited license for the use of EdgeAnalytics AI Apps (Essentials) with object classification extension of bring-in warranty to a total of 60 months (ex factory only)
Optional Maintenance (after the included 60 months)	
008782	Panomera® S/W 4 Software Maintenance (Plus 12 Months) License for the update of Domera® OS with updates, upgrades and security updates ²⁾ for 12 months, license for the update of neural networks for object classification for 12 months.
Optional Warranty	
008783	Panomera® S/W 4 Hardware Warranty (Total of 60 Months) Extension of bring-in warranty to a total of 60 months
Optional Licenses	
008784	DLC - Panomera® S/W 4 EdgeAnalytics AI Apps (Essentials) License for the use of EdgeAnalytics AI Essential Apps (AI Motion Detection, AI Tamper Detection, AI Loitering Detection, AI Intrusion Detection, AI Line Crossing, AI Vehicle Parking) based on the neural network for object classification (person, animal, car, large vehicle, two-wheeler)
009294	DLC - Panomera® S/W 4 AI High Resolution Counting App License for the use of the EdgeAnalytics AI High Resolution Counting App for the definition of counting zones and fill level reports. License for the use of the AI High Resolution Counting neural network for object classification of persons and vehicles in the entire captured image at higher resolution and adjustable count rate on a Panomera® S/W 4 camera.
009291	DLC - Panomera® S4 AI Perimeter App Package License for the use of the neural network AI Perimeter for the object classification of persons (also with unusual posture, movement type and clothing), cars, large vehicles and two-wheelers. License for the use of the EdgeAnalytics AI Perimeter App with protected areas, pre-zones and escalation of messages based on object classification. License for the use of the EdgeAnalytics AI Extended Tamper App with advanced tamper detection based on changes of the captured scene.

2) Security updates for relevant CVE vulnerabilities that become known will be provided (subject to technical feasibility) for the entire runtime of the software maintenance.

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Sensor System		
Type of sensors	CMOS	
Number of sensors	4	
Number of sensor pixels	48 MP	
Light sensitivity	<0,05lux	
Dynamic range (UWDR)	130 dB (effective)	
Resolution	Panomera® S4 70/15	Panomera® S4 70/30
Effective resolution (MPe) ³⁾	70 MP	70 MP
Identification distance (≥250 px/m)	Up to 97 m	Up to 48 m
Recognition distance (≥125 px/m)	Up to 194 m	Up to 97 m
Observation distance (≥62 px/m)	Up to 392 m	Up to 195 m
Installation Height	Panomera® S4 70/15	Panomera® S4 70/30
Recommended	5 m	5 m
Permissible	4.5 - 8 m	4.5 - 8 m
Tilt toward the ground	4°	3°
Transition distance ⁴⁾	71 m	35 m
Field of View & Aspect Ratio	Panomera® S4 70/15	Panomera® S4 70/30
Horizontal field of view	15°	30°
Vertical field of view	26°	51°
Aspect ratio (H:V)	3:5	3:5
Format and Encoding		
Video compression	H.264, H.265, MJPEG	
Frame rate	Up to 30 fps at full resolution	
Live streaming	Multicast or Unicast (for Viewing Client) Unicast (for recording)	
Network and Recording		
Required network bandwidth	64 Mbps ⁵⁾ (nominal, for recording)	
Recommended network bandwidth	1,000 Mbps	
Functions		
Operating system	Domera® OS	
Secure Boot	Supported (activation optional) ⁶⁾	
Day/Night switching	Ambient light sensing and removable IR cut filter (ICR)	
Black-and-white mode	Automatic (at low light or in night mode)	
Digital noise reduction	3D-DNR	
Brightness control	Automatic (ALC)	
Gain control	Automatic (AGC)	
White balance	Automatic (AWB)	
Privacy Zone Masking	Hiding/masking of up to 16 protected areas per sensor (up to 100% of the entire image)	
Video Content Analysis (VCA)	VCA Motion Detection, VCA Tamper Detection, VCA Intrusion Detection, VCA Line Crossing	
EdgeAnalytics AI Apps (Essentials) ⁷⁾	AI Motion Detection, AI Tamper Detection, AI Loitering Detection, AI Intrusion Detection, AI Line Crossing, AI Vehicle Parking	
EdgeAnalytics Object Classes	Person, animal, car, large vehicle, two-wheeler	
EdgeAnalytics Actions	Notification via DaVid/PGuard, switching of network relays, message via MQTT/HTTP	

- 3) Effective resolution MPe: A conventional single sensor camera would have to be equipped with up to 70 megapixels image sensor in order to provide the same resolution across the entire object space as these Panomera® systems.
- 4) Orientation point on the floor as an adjustment aid for optimum camera tilt. The transition between the two top sensors (with the grid displayed in the client software or in the web browser configuration) should be aligned with this point.
- 5) This value is based on the encoding of each sensor with 6 Mbps and the use of the recording system as a proxy for the live view.
- 6) Once Secure Boot has been activated, it is no longer possible to downgrade to an older version of the operating system that does not support Secure Boot.
- 7) Optional license DLC - Panomera® S/W 4 EdgeAnalytics AI Apps (Essentials) or AI Panomera® S/W 4 Support and License Interval Premium required.

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Protocols	
Ethernet protocols	IPv4 (ARP, ICMP, IGMPv2/IGMPv3), UDP, TCP, LLDP, CDP (v1,v2), DSCP (QoS), DNS, NTP, HTTP/HTTPS, RTSP/RTP/RTCP, SNMP (v1, v2c, v3), MQTT
Ethernet protocols in preparation	IPv6 (NDP, ICMPv6, MLDv1/MLDv2, SLAAC, RDNSS), UDPv6, TCPv6, DNSv6, LDAP
Communication protocols	DaVid, DaVidS, ONVIF Profile M, ONVIF Profile S, ONVIF Profile T, SNMP (v1, v2c, v3)
Security	HTTPS encryption, SSL/TLS 1.2, 1.3 (AES), network access control according to IEEE 802.1X
Connections	
Ethernet 1	Telegärtner STX V4 socket with STX RJ45 coupling Cat.6 for 1000BASE-T (1,000 Mbps)
Ethernet 2	Telegärtner STX V4 socket with STX RJ45 coupling Cat.6 for 1000BASE-T, PoE+ Out, 30 W, IEEE 802.3at (100 Mbps, service port)
Power IN	HARTING connector (5-pole)
Electrical Data	
Voltage supply	Camera: 48 V DC $\pm 5\%$ Heater: 48 V DC $\pm 5\%$
Power consumption	Camera: Max. 70 W ⁸⁾ Heater: Max. 60 W
Mechanical Data	
Dimensions (W x H x D)	Approx. 348 x 183 x 441 mm (13.7" x 7.2" x 17.4")
Weight	Approx. 16 kg (35.3 lb)
Material	Aluminium
Processing	Chromated
Finish	Powder coating, tested for seawater resistance according to DIN EN 60068-2
Color	Signal white (RAL 9003 ⁹⁾), housing Signal black (RAL 9004 ⁹⁾), front frame
Adjustment	Stepless alignment on 3-axes, vertical up to $\pm 15^\circ$, horizontal up to $\pm 7^\circ$ (Mountera® Ball Joint 15°)
IP rating	IP69
Environmental Conditions	
Installation sites	Indoor and outdoor
Operating temperature	-40°C to $+60^\circ\text{C}$ (installation with Panomera® Sunshield recommended)
Minimum start-up temperature	$> -30^\circ\text{C}$
Heater On	$< +10^\circ\text{C}$
Heater Off	$> +10^\circ\text{C}$
Relative humidity	0%–90% RH, non-condensing
Miscellaneous	
Security module	Integrated (fTPM)
Ambient light sensor	Integrated
Removable IR-cut filter	Integrated
Local memory	50 MB RAM memory per sensor
Configuration and live video	Web browser (all major platforms), Dallmeier Device Manager (with Panomera® AutoCalibration add-on)
Languages	German, English,
Programming interface	Open platform for integration into 3rd party systems using API
ONVIF compliance	Profile M, Profile S, Profile T
GDPR compliance	Supported
NDAA compliance	Supported
Approvals/Certifications	
Type	CE, FCC, RCM, UL, EN 60950-22 compliant (outdoor parts)

8) Maximum power consumption camera 40 W, in connection with PoE+ Out (Ethernet 2) maximum 70 W.

9) The color of the powder coating may differ slightly from the RAL color indicated. This is due to production and does not constitute a defect.

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