 BOSCH Security Systems P.O. Box 80002 5600 JB Eindhoven, The Netherlands	Product Tests Report	
	MIC IP starlight 7100i and MIC IP ultra 7100i	7 November 2019
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Product Tests Report

Product name: MIC IP starlight 7100i and MIC IP ultra 7100i

Model number and description:

MIC-7522-Z30B, PTZ 2MP HDR 30x IP68 black

MIC-7522-Z30W, PTZ 2MP HDR 30x IP68 white

MIC-7522-Z30G, PTZ 2MP HDR 30x IP68 grey

MIC-7522-Z30BR, PTZ 2MP HDR 30x IP68 enhanced black

MIC-7522-Z30WR, PTZ 2MP HDR 30x IP68 enhanced white

MIC-7522-Z30GR, PTZ 2MP HDR 30x IP68 enhanced gray

MIC-7504-Z12BR, PTZ 8MP 12x IP68 enhanced black

MIC-7504-Z12WR, PTZ 8MP 12x IP68 enhanced white


MIC-7504-Z12GR, PTZ 8MP 12x IP68 enhanced gray

The above-mentioned Bosch Security Systems product has been tested in accordance and was found to comply with the tests listed below which were carried out during the development phase of the product. Please note that for some tests, test conditions exceed the range that Bosch recommends for effective continuous operation of the camera.

Data subject to change without notice.

ENVIRONMENTAL TEST


BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
Dry heat Operational IEC-60068-2-2, edition 6.0 (2007-07-16)	Temp. +70 °C, duration 48 hours	Illuminator included.	Yes
Dry heat Storage IEC-60068-2-2, edition 5.0 (2007-07-16)	Temp. +70 °C, duration 4 hours	Illuminator included.	Yes
Cold storage IEC-60068-2-1, edition 6.0 (2007-03-13)	Temp. -40 °C, duration 4 hours	Illuminator included.	Yes
Cold operational IEC-60068-2-1, edition 6.0 (2007-03-13)	Temp. -40 °C, duration 48 hours	Illuminator included.	Yes
Cold start test	Power off, soak (4 hours) @ -40 °C, power up unit, unit must power up & function normally within < 50 minutes.	Illuminator included.	Yes
Cold Operational Endurance IEC-60068-2-1, edition 6.0 (2007-03-13)	Temp -40 °C, Duration 48 hours	Illuminator included.	Yes
Damp Heat (Operational) IEC-60068-2-30, edition 3.0 (2005-08-10)	70 °C / 95 %RH for 6 hours, 35 °C/85% RH for 16 hours. Repeat for 5 cycles total.	Illuminator included.	Yes
IEC 60529 Ingress Protection Rating (IPxx) Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	(Camera with mounting adaptor) Dust tight (no dust ingress; complete protection against contact). Water immersion: 24 hours Water depth: 1.8 meters	IP68 Illuminator included.	Yes
IEC 60529 Ingress Protection Rating (IPxx) Degrees of protection provided by enclosures (IP Code) [Dust, water ingress (operational)]	(Camera with MIC-IP67-5PK kit) Dust tight (no dust ingress; complete protection against contact). Water immersion: 30 minutes Water depth: 1 meter	IP67 Illuminator included.	Yes
UL Type rating (similar to NEMA XX)	Water immersion: 24 hours	Type 6P (UL)	Yes

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BS EN 50130-5:1999 Alarm systems Part 5: Environmental test methods	Specific Test Description (Temperatures stated are outside of the camera housing)	Comments	Passed
	Water depth: 1.8 meters	Illuminator included.	
Salt Mist Spray ISO 12944-6: C5-M (High); Aluminum Housing Components	1440 hrs at 35 °C, 5 parts Sodium Chloride and 95 parts water, then 720 hrs at 38%, D.I Water	Illuminator included last 440 hrs.	Yes
External Mechanical Impact (IK Code or Impact rating) IEC 62262:2002-02	IK10- Energy 20J, 5.05 kg steel mass test slug, 50 mm striking radius, drop height 0.4037 m 5 drops per side, impact 5 sides, 25 total impacts. Excludes window.	Fully functional after all impacts and cycling power.	Yes
Vibration sinusoidal operational IEC 60068-2-6:1995 Test Fc: Vibration (sinusoidal), 10m/s ² (1.0G)	Freq. Range 10-150Hz, 10m/s ² , 3 axes, sweep rate 1 octave/m 20 sweeps/axis, (1.0g)	0.5G on canted unit	Yes
Sinusoidal vibration test IAW MIL-STD-167-1A	Exploratory Test 4Hz - 25Hz @ .01-in single amplitude (.02-in DAD) 1Hz frequency intervals for (15) second dwells. Variable Frequency Test 4Hz - 15Hz @ .03-in single amplitude (.06-in DAD) 16Hz - 25Hz @ .02-in single amplitude (.04-in DAD) 1Hz frequency intervals for (5) minute dwells. Endurance Testing 25Hz @ .02-in single amplitude (.04-in DAD) The duration of Endurance Testing is to be 2 hours total, and should be performed at each frequency of prominence identified in the Exploratory and Variable Freq Tests previously performed		Yes
Shock operational IEC 60068-2-27:4.0 2008-02	Shock, Half Sine Impulse, 11ms, 45G, non-repetitive shocks (three shocks in each axis and in each direction)	Illuminator included. 20G on canted units	Yes
Vibration, Sinusoidal NEMA TS-2-2003, Section 2.2.8	Frequency range: 5 to 30 Hz, Number of axes: 3, Sweep rate: Resonant Search: 1 full sweep within a period of 12.5 min. Endurance: 1 octave x min-1. Amplitude: Resonant Search: 0.015in. double amplitude (pk-pk) displacement - Endurance: 0.5g (5 m/s ²)	Illuminator included.	Yes
Wind speed (160mph wind tunnel test)	(MIC IP starlight 7100i camera only, MIC sunshield, MIC illuminator) Sustained 120-150 mph winds for a 40 minute period without structural damage or loss of video or PTZ function.	Illuminator and sunshield included.	Yes
Sound level (audible noise)	< 65 dB		Yes
Transportation Tests (ISTA 2A)	Cycles per min. (rpm) 285, Frequency 4,75Hz, Duration 50 minutes		Yes
Transportation Tests (ISTA 2A (modified))	ISTA - 0.810 m free fall drop 10 faces/edge/corner of box		Yes

ADDITIONAL CERTIFICATIONS


Functional tests description	Description	Comments	Passed
SMPTE 274M-2008 Standard 3840 x 2160 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates	Resolution: 3840x2160 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25 and 30 frames	For 4K cameras	Yes

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1920 x 1080 Image Sample Structure, Digital Representation and Digital Timing Reference Sequences for Multiple Picture Rates	Resolution: 1920x1080 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25, 30, 50 and 60 frames/	For HD cameras	Yes
SMPTE 296M-2001 Standard 1280 x 720 Progressive Image Sample Structure - Analogue and Digital Representation and Analogue Interface	Resolution: 1280x720 Scan: Progressive Color representation: complies with ITU-R BT.709 Aspect ratio: 16:9 Frame rate: 25, 30, 50 and 60 frames/s	For HD cameras	Yes
Conformant with NTCIP protocols 1205, 2301, 1101:1996, 2202:2001, 2101:2001, 2102:2003		For ITS models only	Yes
Conformant with Open Network Video Interface Forum (ONVIF)	Interoperability between network video products, regardless of manufacturer Profile S, Profile G, Profile T		Yes

ADDITIONAL ENVIRONMENTAL – FUNCTIONAL BOSCH TESTS


Environmental test methods	Specific Test Description	Comments	Passed
MTBF calculation of used components Based on: for electronics, MIL-HDBK-217FN1, GB, GC, 25 °C.	<p>MIC IP starlight 7100i camera only (MIC-7522-Z30x): MTBF 95,327 hours MIC IP starlight 7100i camera only (MIC-7522-Z30x + illuminator): MTBF 87,738 hours</p> <p>MIC IP starlight 7100i camera only (MIC-7522-Z30xR): MTBF 90,600 hours MIC IP starlight 7100i camera only (MIC-7522-Z30xR + illuminator): MTBF 83,718 hours</p> <p>MIC IP starlight 7100i camera only (MIC-7504-Z12xR): MTBF 91,423 hours MIC IP starlight 7100i camera only (MIC-7504-Z12xR + illuminator): MTBF 84,420 hours</p>		Yes
HALT (Highly Accelerated Life Test)	<p>Ambient Operational Test: +25 °C Completed: 11/26/2013</p> <p>HALT LOL/UOL Voltage Test: 1 - Step mains voltage down from nominal 24VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. Completed: 01/22/2014*</p> <p>2 - Step mains voltage up from nominal 24 VAC by 2 volts every 5 minutes until operational failure and/or destruct failure. Completed: 01/24/2014*</p> <p>HALT LOL/UOL Temperature Test: 1 - Step temperature down from -40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure. Completed: 01/16/2014*</p> <p>2 - Step temperature up from +40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure.</p>	Illuminator included.	Yes

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Environmental test methods	Specific Test Description	Comments	Passed
	<p>Completed: 01/23/2014*</p> <p>HALT Vibration Test: 1 - The DUT is initially vibrated at acceleration level of 5g (rms) for minimum period of at least 10 minutes. After 10 minutes' exposure, the DUT is tested operationally and results are recorded. The operating vibration level is then increased by 5g (rms) and the process is repeated for the next step in the test. This sequence is repeated until the DUT fails operational testing or the test level reaches 50g (rms).</p> <p>COLD Start Test: 1 - Set chamber temperature at -45 °C. Power removed from test unit for minimum period of 5 hours, then operate the test switch to restore power. The test unit shall complete its start-up sequence and then resume operation. Completed: 11/27/2013</p>		
NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements	TS 2 Section 2.2.7 Transients, Temperature, Voltage, and Humidity Tests (74 °C)		Yes
NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements	TS 2 Section 2.2.8 Vibration - 5-30 Hz, 0.5g, Resonant Frequency Search 1 hour endurance test	Illuminator included.	Yes
NEMA TS-2 Traffic Controller Assemblies with NTCIP Requirements	TS 2 Section 2.2.9 Shock (Impact) Test Half Sine Impulse, 11ms, 10g	Illuminator included.	Yes
Mil-Std-810-G, 510.5	Sand and Dust		Yes
Mil-Std-810-G, 506.5	Rain		Yes
Mil-Std-810-G, 505.5	Solar Radiation		Yes
Mil-Std-810-G, 501.5	High Temperature		Yes
Mil-Std-810-G, 502.5	Low Temperature		Yes
Mil-Std-810-G, 503.5	Temperature Shock		Yes
Mil-Std-810-G, 509.5	Salt Fog		Yes

Approvals Safety, EMC and Environmental

Specific Approval	Description	Comments	Passed
EMC Europe			Passed
Directive 2014/30/EU	EMC Directive- Electromagnetic compatibility (recast) Text with EEA relevance	Illuminator included.	Yes
EN 50130-4:2011	Part 4: Electromagnetic compatibility - Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.	Illuminator included.	Yes
EN 50121-4:2016	Railway applications	Illuminator included.	Yes
EN 55032	Radiated and Conducted Emissions	Illuminator included.	Yes
EN 61000-4-2	ESD Susceptibility	Illuminator included.	Yes
EN 61000-4-3	Radiated electromagnetic fields	Illuminator included.	Yes
EN 61000-4-4	Electrical Fast Transient (EFT) Burst	Illuminator included.	Yes
EN 61000-4-6	Conducted Immunity	Illuminator included.	Yes
EMC USA			Passed
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure	Illuminator included.	Yes

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Specific Approval	Description	Comments	Passed
Mains Voltage Tolerance Test (Brown out supply voltage test)	Camera fully operational down to 105V (230 V PSU) and 55V (120V PSU). Below this voltage, the camera is not operational. Camera must be power- cycled for the camera block to reset.	Illuminator included.	Yes
Safety Europe			Passed
	Low Voltage Directive (LVD) - Electrical equipment designed for use within certain voltage limits Text with EEA relevance	Illuminator included.	Yes
IEC 60950-1:2005 (2nd Edition) + A1:2009 EN 60950-1:2006/A11:2009/A1:2010/A12:2011	Information technology equipment – Safety – Part 1: General requirements	Illuminator included.	Yes
IEC 62368-1	Safety standard for Information Technology Equipment and Audio/Video Equipment.	Illuminator included	Yes
Safety USA + Canada			Passed
UL 60950-1 (2nd edition dated March 27, 2007; revised December 19, 2011) CAN/CSA-C22.2 No.E60950-1 (CSA C22.2 No. 60950-1-07, R2012)	UL listing + cUL listing. Information technology equipment – Safety – Part 1: General requirements	Illuminator included.	Yes
International CISPR 32	Product market with BOSCH supplier code N663	Illuminator included	Yes

Environmental			Passed
Restriction of Hazardous Substances	ROHS complaint	Illuminator and sunshield included.	Yes
Prohibited and declarable substances in products, components, materials and preparations.	Manufacturer's declaration database based on N 2580-1	Illuminator and sunshield included.	Yes
IEC 60950-22	Part 1: General requirements		Yes
UL 60950-22 EN 60950-22 UL 50E			Yes
Condensation testing* (inside glass)	25 °C / 50 %RH for 1 hour, 5 °C/50% RH for 1 hour, -30°C/50% RH for 1 hour.	Illuminator included.	Yes
Defrosting testing*	1/8" ice buildup defrosted		Yes

*Not on MIC-7522-Z30x cameras

Functional and specification test

Functional tests description		Comments
Camera Performance	Refer to datasheets of MIC IP starlight 7100i and MIC IP ultra 7100i.	
Illuminator Performance	Refer to MIC IP starlight 7100i Illuminator datasheet.	

The product is produced by a manufacturing organization which is certified on **ISO9001** and **ISO14001** standards.