 <b>BOSCH</b> <b>Security Systems</b> 1706 Hempstead Road Lancaster, PA 17601	<b>Product Tests Report</b>	
	TO WHOM IT MAY CONCERN	19 June 2018 Page: 1 of 5

## Product Tests Report

Product name: MIC IP starlight 7000i

Model number and description:

MIC-7502-Z30B, PTZ camera 2MP HDR 30x IP68 IK10, black

MIC-7502-Z30W, PTZ camera 2MP HDR 30x IP68 IK10, white

MIC-7502-Z30G, PTZ camera 2MP HDR 30x IP68 IK10, gray

MIC-ILB-300, Illuminator white-IR light 450m, black

MIC-ILW-300, Illuminator white-IR light 450m, white

MIC-ILG-300, Illuminator white-IR light 450m, gray


MIC-67SUNSHLD, Sunshield for MIC7000 cameras

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 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +65 °C, duration 48 hours	Illuminator included.	Yes
Dry heat Storage IEC 60068-2-2:1974 +A1:1993+ A2:1994	Temp. +75 °C, duration 4 hours	Illuminator included.	Yes
Cold operational IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp. -45 °C, duration 48 hours	Illuminator included.	Yes
Cold start test	Power off, soak overnight (8 hours) @ -45 °C, power up unit, unit must power up & function normally within < 30 minutes.	Illuminator included.	Yes
Cold Endurance IEC 60068-2-1:1990 +A1:1993+ A2:1994	Temp -45 °C, Duration 4 hours	Illuminator included.	Yes
Humidity, operational Damp heat, steady state operational IEC 60068-2-30:1988	65 °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 Water depth: 1.8 meters	Type 6P (UL) Illuminator included.	Yes
Salt Spray ASTM B117 standard for corrosion resistance	2000 hrs at 35 °C, 95%RH, 5% NaCl	Illuminator included.	Yes
External Mechanical Impact (IK Code or Impact rating)	IK10- Energy 20J, 5.05 kg steel mass test slug, 50 mm striking radius, drop height	Fully functional after all impacts and cycling	Yes


 <b>BOSCH</b> <b>Security Systems</b> 1706 Hempstead Road Lancaster, PA 17601	<b>Product Tests Report</b>	
		19 June 2018
	TO WHOM IT MAY CONCERN	Page: 2 of 5

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
IEC 62262:2002-02	0.4037 m 5 drops per side, impact 5 sides, 25 total impacts. Excludes window.	power Illuminator included.	
Vibration sinusoidal operational IEC 60068-2-6:1995 Test Fc: Vibration (sinusoidal), 10m/s <sup>2</sup> (1.0G)	Freq. Range 10-150Hz, 10m/s <sup>2</sup> , 3 axes, sweep rate 1 octave/m 20 sweeps/axis, (1.0g)		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 60068-2-27:1987	Shock, Half Sine Impulse, 6ms, 40G	Illuminator included.	Yes
Wind speed (150mph wind tunnel test)	(MIC7000 camera only, MIC sunshield, MIC7000 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 Procedure 1A)	ISTA - Vibration 14,200 vibratory shocks - 2 axis	Illuminator included.	Yes
Transportation Tests (ISTA Procedure 1A)	ISTA - 36 inches (0.9 m) free fall drop 6 faces of box	Illuminator included.	Yes


#### ADDITIONAL CERTIFICATIONS

Functional tests description	Description	Comments	Passed
SMPTE 274M-2008 Standard 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			Yes
Conformant with Open Network Video Interface Forum (ONVIF)	Interoperability between network video products, regardless of manufacturer Profile S, Profile G		Yes

#### ADDITIONAL ENVIRONMENTAL - FUNCTIONAL BOSCH TESTS

 <b>BOSCH</b> <b>Security Systems</b> 1706 Hempstead Road Lancaster, PA 17601	<b>Product Tests Report</b>	
	TO WHOM IT MAY CONCERN	
	19 June 2018	Page: 3 of 5


Environmental test methods	Specific Test Description	Comments	Passed
MTBF calculation of used components Based on: for electronics, MIL-HDBK-217FN1, GB, GC, 25C.	MIC7000 camera only: MTBF 100,000 hours Camera + illuminator: MTBF 80,000 hours	Illuminator included.	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. 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>	Illuminator included.	Yes
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

 <b>BOSCH</b> <b>Security Systems</b> 1706 Hempstead Road Lancaster, PA 17601	<b>Product Tests Report</b>	
		19 June 2018
	TO WHOM IT MAY CONCERN	Page: 4 of 5

Environmental test methods	Specific Test Description	Comments	Passed
Mil-Std-810-G, 503.5	Temperature Shock		Yes
Mil-Std-810-G, 509.5	Salt Fog		Yes
Mil-Std-810-G, 509.5	Ice/Freezing Rain		Yes

#### Approvals Safety, EMC and Environmental

Specific Approval	Description	Comments	Passed
<b>EMC Europe</b>			<b>Passed</b>
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 61000-3-2:2006 + A2:2009	Mains harmonics Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)	Illuminator included.	Yes
EN 61000-3-3:2008	Voltage fluctuations Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection.	Illuminator included.	Yes
EN 50121-4:2006	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 61000-4-5	Levels ±0.5, 1 and 2kV common mode. ± 0.5, 1 and 2kV differential mode. To ALL input / output - and supply-wiring.	Illuminator included.	Yes
EN 61000-4-6	Conducted Immunity	Illuminator included.	Yes
EN 61000-4-11	Voltage Dip and Short Interruption	Illuminator included.	Yes
<b>EMC USA</b>			<b>Passed</b>
CFR 47 FCC part 15 Class A	Conducted + Radiated Emission based on VERIFICATION procedure	Illuminator included.	Yes
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
<b>Safety Europe</b>			<b>Passed</b>
Directive 2014/35/EU	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
<b>Safety USA + Canada</b>			<b>Passed</b>
UL 60950-1 (2nd edition dated March 27, 2007; revised December 19, 2011)	UL listing + cUL listing. Information technology equipment – Safety – Part 1: General requirements	Illuminator included.	Yes

 <b>BOSCH</b> <b>Security Systems</b> 1706 Hempstead Road Lancaster, PA 17601	<b>Product Tests Report</b>	
	19 June 2018	
	TO WHOM IT MAY CONCERN	
		Page: 5 of 5

Specific Approval	Description	Comments	Passed
CAN/CSA-C22.2 No.E60950-1 (CSA C22.2 No. 60950-1-07, R2012)			
Australian AS/NZS 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	Report for camera: US-23589-A2-UL Report for illuminator: US-23566-UL	Yes
UL 60950-22 EN 60950-22 UL 50E		Report for camera: E183863-A34-CB-1 Report for illuminator: E183863-A40-CB-1	Yes

#### Miscellaneous specifications

Description		Comments
Pan and tilt drive output torque	Pan = 8.5 N m (6.72 ft lb) Tilt = 15.84 N m (11.62 ft lb)	

#### Functional and specification test

Functional tests description		Comments
Camera Performance	Refer to MIC IP starlight 7000i datasheet.	
Illuminator Performance	Refer to MIC IP starlight 7000i Illuminator datasheet.	

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