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| **Security Systems** 1706 Hempstead Road  Lancaster, PA 17601 | **Product Tests Report** |  |
| 22 November 2016 |
| TO WHOM IT MAY CONCERN | Page: 1 of 5 |

**Product Tests Report**

Product name: MIC IP starlight 7000 HD Camera

Model number and description:

MIC-7230-B5 Rugged PTZ 2MP 30x Black CPP4

MIC-7230-W5 Rugged PTZ 2MP 30x White CPP4

MIC-7230-G5 Rugged PTZ 2MP 30x Gray CPP4

MIC-ILB-100 Illuminator, IR/White light combo, Black

MIC-ILW-100 Illuminator, IR/White light combo, White

MIC-ILG-100 Illuminator, IR/White light combo, Grey

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

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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 |
| 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 60068-2-2:1988 | 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 without mounting adaptor; exposed  connectors in base of camera) 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 |

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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 |
| External Mechanical Impact (IK Code)  IK## Rating [“Vandalism-proof test”]  IEC 62262:2002-02 | 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. | IK10  Fully functional after all impacts and cycling power  Illuminator included. | Yes |
| Vibration sinusoidal operational  IEC 60068-2-6:1995  Test Fc: 10 m/s² (1.0 g) | Freq. Range 10-150Hz, 20m/s², 3 axes, sweep rate 1 octave/m 20 sweeps/axis, (2.0g) |  | 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 @ .03in single amplitude (.06-in DAD)  16Hz – 25Hz @ .02-in single amplitude (.04in 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 | Half Sine Impulse, 6ms, 40g | Illuminator included. | Yes |
| Medium weight Hammer Shock  IAW MIL-S-901D | Equipment class I, Shock test type A, grade A & B |  | 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

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| 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 and 30 frames/s | 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 |  | Yes |

# ADDITIONAL ENVIRONMENTAL – FUNCTIONAL BOSCH TESTS

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| 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 91,000 hours Camera + illuminator: MTBF 80,000 hours | Illuminator included. | Yes |
| HALT (Highly Accelerated Life Test) | Ambient Operational Test: +25 °C  Completed: 11/26/2013    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\*     1. - 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\*    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\*     1. - Step temperature up from +40 °C by 5 °C every 4 hours (minimum) until operational failure and/or destruct failure.   Completed: 01/23/2014\*    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).  Completed: 02/28/2014    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 | 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) | Illuminator included. | 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 |

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| 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 |

# Approvals Safety, EMC and Environmental

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| Specific Approval | Description | Comments | Passed |
| **EMC Europe** |  |  | Passed |
| EN 55022:2010 | Information Technology Equipment- Radio disturbance characteristics Limits and Methods of measurement. Class A | 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 |
| IEC 61000-4-3 Compatibility/ EN 61000-4-3 | Frequency Range: 80MHz to 2700 MHz  Field strength: 10 V/m  Modulation: Amplitude Modulation : 80%, 1KHz, sinusoidal  Pulse Modulation: 1Hz (0.5 seconds ON, 0.5 seconds OFF) |  | Yes |
| EN 50121-4:2006 | Railway applications | Illuminator included. | Yes |
| **EMC USA** |  |  | Passed |
| CFR 47 FCC part 15 Class A | Conducted + Radiated Emission based on VERIFICATION procedure | Illuminator included. | Yes |
| **Australian**  AS/NZS CISPR 22 equal to CISPR 22 | Product market with BOSCH supplier code N663 |  | 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 |
| Lightning protection EN 61000-4-5:2006 | Levels ±0.5, 1 and 2kV common mode. ± 0.5, 1 and 2kV differential mode. To ALL input / output - and supply-wiring. |  | Yes |
| **Safety Europe** |  |  | Passed |
| 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 |
| **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 |

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| **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

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| 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

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| Functional tests description |  | Comments |
| Camera Performance | Refer to MIC IP starlight 7000 HD datasheet. |  |
| Illuminator Performance | Refer to MIC7000 Illuminator datasheet. |  |

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