

Illustra, the IP camera product line for Security Products, a division of Building Technologies & Solutions for Johnson Controls, is a leading manufacturer and designer of video surveillance products. Security and other industries require a full line-up of cyber secure, high-definition video devices that provide superior low-light, wide dynamic range, low network latency, multiple codecs, and streams. The Pro, Flex, Essential, Standard family of Illustra IP cameras include PTZ and Fisheye devices, as well as a variety of different form-factor cameras such as Mini-Dome, Bullet, Box and Micro.

For additional information, please contact:

Tyco Security Products
6 Technology Park Drive
Westford, MA 01886 USA
Phone: +1 978 577 4000
Email: VideoApps@tycoint.com
Web: www.illustracameras.com

Standard Gen3 5MP IR DOME NETWORK IP CAMERA (ISIN-V05M031-N)

MasterFormat 2016:
28 21 13 IP Cameras

Notes to Specifier:

1. Explanatory notes and comments are presented in **colored** text.



Notice

Please read this A&E document thoroughly and save it for future use before attempting to specify this unit. The information in this document was current when published. The manufacturer reserves the right to revise and improve its products. All specifications are therefore subject to change without notice.

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Important Note to Security Systems Specifiers

CSI MasterFormat 2016 incorporates numerous significant changes affecting electronic safety and security. This document is written using MasterFormat 2016. The following is a guide to the MasterFormat numbers relevant to the product referenced in this specification.

Primary Specification Area:

MasterFormat 2016:

28 20 00	Video Surveillance
28 21 00	Surveillance Cameras
28 21 13	IP Cameras

Related Requirements:

MasterFormat 2016:

Division 27 Communications

27 20 00	Data Communications
27 21 00	Data Communications Network Equipment
27 21 29	Data Communications Switches and Hubs

Division 28 Electronic Safety and Security

28 05 00	Common Work Results
28 05 07.13	Power Sources for Video Surveillance
28 05 07.21	PoE Power Sources for Electronic Safety and Security
28 05 11	Cyber Security Requirements for Electronic Safety and Security
28 05 19.13	Hybrid Digital Video Recorders
28 05 19.15	Network Video Recorders
28 05 33	Safety and Security Network Communications Equipment
28 06 20	Schedules for Video Surveillance
28 21 19	Camera Mounts
28 23 00	Video Management System

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes a True Day/Night Smart/Adaptive IR 5MP imager network IP outdoor vandal Dome camera with single RJ-45 port for HD quality images, True WDR for superior low-light performance, and high-sensitivity low-noise CMOS progressive sensor.
 - 1. Product: A NVT complaint ONVIF Profile S G M T, standard high-speed camera powered by 802.3af Type 1 (15w) Class 3 or 12VAC.
- B. Related Requirements

Refer to Master Format notes at the beginning of this document to select requirements specific to the MasterFormat version being used in the specification.

1.02 REFERENCES

- A. Abbreviations
 - 1. 2D/3D DNR 2-Dimensional / 3-Dimensional Digital Noise Reduction
 - 2. 5MP Five Megapixel (5,000,000 pixels)
 - 3. AEC Automatic Exposure Control
 - 4. ARP Address Resolution Protocol
 - 5. B/W Black and White
 - 6. BNC Bayonet Neill Concelman connector
 - 7. CAT5 Category 5 twisted pair Ethernet cable
 - 8. CAT5E Category 5 Enhanced twisted pair Ethernet cable
 - 9. CAT6 Category 6 twisted pair Ethernet cable
 - 10. CBR Constant Bit Rate
 - 11. CMOS Complementary Metal-Oxide Semiconductor image sensor
 - 12. CVBR Constrained Variable Bit Rate
 - 13. CCTV Closed-Circuit Television (aka Video Surveillance)
 - 14. DHCP Dynamic Host Configuration Protocol
 - 15. DNS Domain Name System
 - 16. DDNS Dynamic Domain Name System
 - 17. DOF Depth of Field
 - 18. EAP-TLS Extensible Authentication Protocol Transport Layer Security
 - 19. EAPoL Extensible Authentication Protocol over LAN
 - 20. FE Fisheye

21. FOV	Field of View
22. FPS	Frames per Second (same as Images per Second)
23. FTP	File Transfer Protocol
24. GB	Giga Bytes
25. GbE	Gigabit Ethernet
26. H.264	MPEG-4 Part 10, Advanced video compression format standard
27. H.265	MPEG-H Part 2, HEVC video compression format standard
28. HD	High Definition
29. HEVC	High Efficient Video Coding
30. HTTP	Hypertext Transfer Protocol
31. HTTPS	Hypertext Transfer Protocol Secure
32. iAPI3	Illustra Application Programming Interface (version 3.x)
33. ICMP	Internet Control Message Protocol
34. ICR	Infrared Cut-filter Removal
35. IETF NTP	Internet Engineering Task Force for Network Time Protocol working group
36. IGMP	Internet Group Management Protocol
37. IK07	Impact Protection (07 = Impact Proof from 40 cm height and 2 joules)
38. IK10	Impact Protection (10 = Impact Proof from 40 cm height and 20 joules)
39. IntelliZip	Illustra enhanced image and bandwidth compression for H.264 & H.265
40. IP	Internet Protocol
41. IP66	Ingress Protection (66 = Dust-Tight and Low Water Pressure)
42. IP67	Ingress Protection (67 = Dust-Tight and Immersion up to 3 feet / 1 meter)
43. IPS	Images per Second (same as Frames per Second)
44. IPv4	Internet Protocol Version 4 (32-bit addresses)
45. IPv6	Internet Protocol Version 6 (128-bit addresses)
46. IR	Infrared
47. LAN	Local Area Network
48. LLDP	Link Layer Discovery Protocol
49. Mbps	Megabits per second (10 or 100 or 1,000)
50. MB	Mega Bytes
51. MD	Mini-Dome form-factor
52. mDNS	Multicast DNS
53. Micro SDXC	Onboard Storage Media Type
54. MJPEG	Motion JPEG video compression format standard
55. mm	Millimeter
56. nm	Nanometer

57. n/a	Not Applicable
58. NR	Noise Reduction
59. NTP	Network Time Protocol
60. NVT	Network Video Transmitter
61. ONVIF	Open Network Video Interface Forum
62. PEAP	Protected Extensible Authentication Protocol
63. PoE	Power over Ethernet standard
64. PoE+	Power over Ethernet Plus standard
65. PPPoE	Point-to-Point Protocol over Ethernet
66. PoE Ultra	Power over Ethernet Ultra
67. PTZ	Pan-Tilt-Zoom optical functionality
68. QoS	Quality of Service
69. ROI	Region of Interest
70. RTCP	RTP Control Protocol
71. RTP	Real-Time Transport Protocol
72. RTSP	Real Time Streaming Protocol
73. SDN	Soft Day/Night
74. SFTP	Secure File Transfer Protocol
75. SMTP	Simple Mail Transfer Protocol
76. SNMP	Simple Network Management Protocol
77. SOAP	Simple Object Access Protocol
78. SSH	Secure Shell protocol
79. SSL	Secure Socket Layer encryption cryptographic protocol
80. TCP/IP	Transmission Control Protocol / Internet Protocol
81. TDN	True Day/Night
82. TLS	Transport Layer Security cryptographic protocol
83. UDP	User Datagram Protocol
84. UPnP	Universal Plus and Play
85. VBR	Variable Bit Rate
86. WAN	Wide Area Network
87. WDR	Wide Dynamic Range
88. WS	Web Services Dynamic Discovery
89. Zeroconf	Zero-configuration networking

B. Reference Standards

1. Safety Standards:

- a. UL 60950-1 – Information Technology Equipment

- b. EN 60950-1 – Information Technology Equipment
 - c. CSA 22.2 No. 60950 – Information Technology Equipment
 - d. IEC 60950-1 – Information Technology Equipment
 - 2. Emissions Standards:
 - a. FCC Part 15 Class A – Commercial or Industrial Use
 - b. EN55032 Class A – Information Technology Equipment
 - c. AS/NZS CISPR 32 Class A – Information Technology Equipment
 - d. ICES-003/NMB-003 Class A – Information Technology Equipment
 - 3. IEEE Standards:
 - a. 802.1x Port-based Network Access Control provides authentication mechanism
 - b. 802.3: Ethernet standard that specifies physical media and working characteristics of Ethernet.
 - c. 802.3af: PoE (Power over Ethernet) standard that provides 12.95 watts (maximum 15.40 watts and 250 mA current) of electrical current over a complaint Ethernet cable (CAT5e or CAT6) as an alternative power source to 24VAC power input for operating the device.
 - d. 802.3at: PoE+ (Power over Ethernet Plus) standard that provides 25.50 watts (maximum 30.00 watts and 600 mA current) of electrical current over a complaint Ethernet cable (CAT5e or CAT6) as an alternative power source to 24VAC power input for operating the device.
 - e. 802.3bt: PoE Ultra (Power over Ethernet Ultra) standard that provides 60.00 watts of electrical current over a complaint Ethernet cable (CAT5e or CAT6) as an alternative power source to 24VAC power input for operating the device.
 - 4. Immunity Standards:
 - a. EN61000-6-1
 - b. EN50130-4
 - 5. Environmental Standards:
 - a. RoHS
 - b. REACH
 - c. WEEE
 - 6. Safety:
 - a. UL60950-1 /UL62368/UL60950-22;
 - b. IEC 60950-1/62368/60950-22;
 - c. CSA 22.2 No. 60950/62368;
 - d. CE: EN60950-1 / EN62368 / EN60950-22;
 - e. EN60529 (IP67)
 - 7. NDAA: Yes
- C. Definitions

1.03 SUBMITTALS

- A. Product Data
 - 1. Manufacturer's printed or electronic data sheets
 - 2. Manufacturer's installation and operation manuals
 - 3. Manufacturer's release notes, application notes, and/or technical bulletins

1.04 QUALIFICATIONS

- A. Manufacturer shall be ISO 9001:2008 certified and a reputable Fortune 100 company with a minimum of 20 years' experience in manufacturing for in the security industry.
- B. Contractor shall provide a competent trainer who has extensive experience with the installed systems and in delivering training to provide the instruction. As an alternative, the Contractor may propose the use of factory training personnel for onsite Professional Services.

1.05 WARRANTY

- A. Manufacturer shall provide a limited 3-year warranty for the device to be free of defects in material and workmanship.

END OF SECTION

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Manufacturer: Tyco Security Products
6 Technology Park Drive
Westford, MA 01886 USA
Phone: +1 978 577 4000
Email: VideoApps@tycoint.com
Web: www.illustracameras.com
- B. Model: ISIN-V05M031-N
- C. Alternatives: 2MP dome

2.02 DESCRIPTION

- A. The network IP camera shall:
2. Built-in web server
 3. Support multiple streams, up to 2560x1920resolution
 4. IR illumination effective to 50m
 5. Progressive scan imager
 6. Onboard storage for local recording
 7. IK10, IP67,
 8. Complies with ONVIF Profile S G M T
 9. Capable of integration with network recording systems which support iAPI3 or ONVIF
 10. Capable of operation as a standalone device on the network
- B. Functions

Motion detection	3 zone
Tamper AI Detection:	Blackout, Whiteout, scene change (FoV tamper)
AI Object Classification	Object Classes: Person, Bicycle, Bus, Car, Motorbike, Train, Truck, Any Object Sub-Classes: Person Clothing Color, Vehicle Color Rules: Object Detected, Perimeter, Linger, Dwell, Abandoned / Removed, Enter, Exit, Crowd, Queue
Smart Defog	Yes (Future release)
WDR	TWDR2x, TWDR3x
Local storage	Micro SD Card
Enhanced Security	Enhanced Security Feature Provides: One-Click Security Hardening, User Access Log, Validates Complex Credentials, Disables Unused Protocols; Encrypted SD card Video Over HTTPS
Tricklestor	Yes
Exposure Profiles	Demo, Auto, Outdoor, Indoor, Gaming, Shutter Priority, Iris Priority, Manual, LPR High/Medium/Low

1. Video Compression
 - a. H.265
 - b. H.265 IntelliZip
 - c. H.264 (default)
 - d. H.264 IntelliZip
 - e. MJPEG
11. Standards: ONVIF Profile S G M T
2. Web Browser access:
 - a. Microsoft Edge
 - b. Google Chrome
 - c. Mozilla Firefox
 - d. Apple Safari
3. Streaming methods for audio, video, and metadata:
 - a. Unicast
 - b. Multicast
 - c. RTSP
 - d. HTTP/HTTPS
4. 4MP resolution camera shall support up to 3 streams with the following resolution options with maximum fps dependent on resolution:
 - a. Stream 1
 - 1) H.265, H.265 IntelliZip, H.264, H.264 IntelliZip
 - a) Maximum of 30 ips @ 2560x1920 without True WDR
 - b) Maximum of 60 ips @ 1920x1080 without True WDR
 - c) Maximum of 25 ips @ 2560x1920 with True WDR
 - d) Maximum of 15 ips @ 2560x1920 with True WDR3x MJPEG
 - a) Maximum of 60 ips @ 1920x1080 without True WDR
 - b) Maximum of 25 ips @ 1920x1080 with True WDR
 - c) Maximum of 15 ips @ 1920x1080 with True WDR3x
 - b. Stream 2
 - 1) H.265, H.265 IntelliZip, H.264, H.264 IntelliZip
 - a) Maximum of 30ips @ 1280x720 without True WDR
 - b) Maximum of 25ips @ 1280x720 with True WDR
 - c) Maximum of 15 ips @ 1280x720 with True WDR3x

MJPEG

- a) Maximum of 30 ips @ 1280x720 without True WDR
- b) Maximum of 25 ips @ 1280x720 with True WDR
- c) Maximum of 15 ips @ 1280x720 with TWDR3x

c. Stream 3

MJPEG

- a) Maximum of 15 ips @ 800x448 with/without True WDR
- d. Maximum Streams: 5 Concurrent streams

Note to specifier: See attached tables for full list of resolutions.

C. Cyber Security and Authentication:

1. Enhanced Security:
 - a. One-Click Security Hardening
 - b. Certificate Management
 - c. Disabling Unused Protocols
 - d. User Access Log for Cyber Audit Trail
 - e. Validate Complex Credentials
 - f. Encrypted SD card
2. IEEE 802.1x:
 - a. EAP-TLS – RFC 5216
 - b. EAPoL – RFC3748 & RFC5247
 - c. PEAP
3. HTTPS Encryption (HTTP over TLS) – RFC2818
4. IP Address Filtering
5. Multi-Level Password Protection
6. TLS – RFC5246 v1.2
7. WS-Security

D. Camera Characteristics:

1. Onboard Storage: (Not Included)
 - a. Type: Micro SDXC Card
 - b. Speed: Class 10 or higher
 - c. Capacity: Maximum of 1 TB
 - d. Encryption
2. Memory:
 - a. ROM/Flash: 512 MB
 - b. RAM: 1GB
3. Video Codec Settings:

- a. H.265 and H.265 IntelliZip
 - 1) High & Main Profile
 - 2) GOP Range: 1 to 150 (default 30)
 - 3) Bit Rate Methods: CBR, VBR, CVBR (default CVBR)
 - 4) VBR Quality: Lowest, Low, Medium, High, Highest (default High)
 - 5) CBR Bit Rates: 16 to 10,000 (default 1,000)
 - 6) CVBR Settings: Maximum bit rate 500 to 10000 (default 8,000)
- b. H.264 and H.264 IntelliZip
 - 1) High & Main Profile
 - 2) GOP Range: 1 to 150 (default 30)
 - 3) Bit Rate Methods: CBR, VBR, CVBR (default CVBR)
 - 4) VBR Quality: Lowest, Low, Medium, High, Highest (default High)
 - 5) CBR Bit Rates: 16 to 10,000 (default 1,000)
 - 6) CVBR Settings: Maximum bit rate 500 to 10000 (default 8,000)
- c. MJPEG
 - 1) Quality: 1 to 100 (default 50)
4. Physical alarms
 - a. Alarm Input: Max 6V (High) and 0.6V (Low)
 - b. Alarm output: voltage limit: 30V (AC Peak) current limit: 1A
5. Audio Settings:
 - a. Standard: G.711 u-law
 - b. Sampling Rate: 8 KHz
 - c. Sampling Rate: 16 bit
 - d. Frequency Response Range: 100 to 3,600 Hz
 - e. Inputs:
 - a. Internal Microphone
 - b. External Microphone
 - 1) Connector Type: Terminal Block
 - 2) Impedance: 20K ohms/attenuation = 0 dB
 - 3) Maximum level: 2Vp-p
 - f. Outputs:
 - 1) Connector Type: Terminal Block
 - 2) Impedance: High
 - 3) Maximum level: 2Vp-p
6. Imager: 1/2.8" Progressive Scan Sony IMX335 CMOS Sensor

7. Illuminator:

- a. Adaptive IR – Yes. Adaptive IR refers to lens position to adjust the IR intensity of both narrow and broad IR LEDs to have better exposure balance.
- b. IR Distance: 50m
- c. Wavelength: 850 nm

8. Lens:

Focal Length	2.7-13.5mm
Focus Range	0.3 to ∞
Field of View Vertical (H/V)	52°/16°
Field of View Horizontal (H/V)	100°/29°
Aperture	f/1.6 (W)
	f/3.3 (T)

- a) Focus Type:
 - 1) Software One touch Auto-Focus
 - 2) Software Manual focus adjustments
- b) Iris Type: P-Iris
- c) IR Correction: Optical Corrective
- d) Day/Night: True D/N with ICR

9. Video Imaging

- a. AE Weighting Methods:
 - 1) Full Picture Weighted
 - 2) Upper
 - 3) Lower
 - 4) Centre Weighted
 - 5) Spot
 - 6) Left
 - 7) Right
 - 8) AI object
 - 9) AI Person
- b. Shutter Speed
 - 1) 1/32,000 to 1/4 sec

Note to specifier: See attached tables for full list of shutter speed at end of document.
- c. Exposure:
 - 1) Profile: Demo, Auto, Indoor, Outdoor, Shutter Priority, Iris Priority, Gaming. License Plate Registration (LPR) High/Medium/Low
 - 2) Compensation Offset Range: -7 to +7 F-Stops (default 3)

- 3) Minimum Exposure: 1/32,000 sec (default)
- 4) Maximum Exposure: 1/4 sec (default)
- 5) Frequency: 50Hz or 60Hz (default 60 Hz)
- 6) Flicker less Mode: Enable or Disable (default Disabled)
- d. White Balance:
 - 1) Auto Normal
 - 2) Auto Wide
 - 3) Manual
- e. Dynamic Range: True WDR 120 dB Technologies
- f. Wide Dynamic Range Methods:
 - 1) True WDR
 - 2) True WDR3x
- g. Noise Reduction:
 - 1) 2D DNR Low Pass Filter
 - 2) 3D DNR Adjacent Frame Filter

Note: Dynamically controlled by JCI software
- h. Flicker Loss: 50/60 Hz or None
- i. Minimum Illumination:

		1 /4, 30 IRE, AGC	1/30, 30 IRE, AGC
ISIN-V05M031-N	color	0.008 Lux	0.06 Lux
	B&W	0.005 Lux	0.04 Lux
	B&W IR	0 Lux	0 Lux

- 10. Privacy Zones: 8 Rectangular Zones
- 11. ROI High Compression Quality Zones: N/A
- 12. Event Alarms:

- a. Triggers:
 - 1) Alarm Input: Max 6V (High) and 0.6V (Low)
 - 2) Analytics Detection
 - 3) Network Loss
 - 4) Temperature
 - 5) Periodic events
- b. Actions:
 - 1) Audio Clip Playback
 - 2) Auxiliary Output: Relay 30V (Peak AC) / 1A
 - 3) CIFS

- 4) FTP file transfer
- 5) SD card storage
- 6) SMTP email file transfer

13. I/O Interfaces:

- a. Alarm Input/Output: 1/1
- b. Audio Input/Output: 1/1
- c. Video Output: 1 BNC Analogue out
- d. Reset/Reboot: 1 Recessed Push Button for reboot
- e. Return to Factory Default Settings: 1 Recessed Push Button
- f. Power LED indicator

14. Menu Languages:

- a. English (US) (Default)

Note to specifier: See attached tables for full list of menu languages.

15. User Accounts:

- a. Administrator
- b. Operator
- c. User

16. Text Overlay:

- a. Camera Name
- b. Date Time
- c. User Defined Text
- d. 4 position options
- e. Text size (Normal or Large)

E. Electrical Characteristics:

1. Input Voltage options:

- a. 802.3af Type 1 (15w) Class 3
- b. 12VAC (-10% to +30%)
- c. Line frequency range (47 to 63 Hz)

2. Power Draw:

POE	POE IEEE 802.3af
PoE class	Class 3
Current draw amps	~850mA
Wattage	~8.2W
12VDC	12VDC
Voltage range	10 - 15.8VDC
Current draw amps	~850mA
Power wattage	~8.2W

F. Network Characteristics:

1. Ethernet interface: 10/100 Mbps Ethernet
2. Ethernet port: Single Copper RJ-45
3. Management
 - a. Remote configuration and management via web browser of the following:
 - 1) System Status
 - 2) IP Address Settings
 - 3) TLS Encryption
 - 4) Password Protected User Levels
 - 5) System Log
 - 6) Device Name
 - 7) Firmware Upgrade
 - b. Remote configuration and management via Illustra Connect of the following:
 - 1) Device Information (Device Name, Hostname, IP Address, Model Name, Product Code, Manufacturer, Firmware Version, Status, MAC Address)
 - 2) Discovery
 - 3) (IPv4, IPv6 or both; ONVIF, CGI IP Address or all 3)
 - 4) Snapshot
 - 5) Configure Network/Users/Date-Time (Single or Bulk)
 - 6) IP Address Settings
 - 7) Diagnostics
 - 8) Firmware Upgrade (Single or Bulk)
 - 9) Access Web Server

- 10) Export Device List in CVS Format
- 11) Device Management (Reset or Reboot)
- 4. Base Protocol: TCP/IP – RFC4614
- 5. Communication Protocol: IGMP
- 6. Discovery Methods:
 - a. mDNS Discovery Zeroconf
 - b. UPnP
 - c. WS-Discovery (ONVIF and Illustra Connect)
 - d. Via Wifi dongle for Illustra Tools App
- 7. Email:
 - a. SMTP – RFC5321
 - b. Authenticated SMTP – RFC4954
- 8. External Interface Protocol:
 - a. iAPI3 v3.4
 - b. ONVIF Profile S G M T
 - c. SOAP
 - d. WS-Addressing
 - e. WS-Eventing
- 9. File Transfer:
 - a. FTP
 - b. SFTP
- 10. Network Address Configurations:
 - a. DHCP – RFC2131
 - b. IPv4 – RFC791
 - c. IPv6 – RFC2460
 - d. LLDP
 - e. Static IP
 - f. Zeroconf – RFC3927
 - g. Illustra Connect Utility
- 11. Network Layer: ICMP
- 12. Network Management: SNMP v2c / v3
- 13. Network Name Resolution:
 - a. DNS – RFC5395
 - b. DDNS – RFC2136
- 14. Streaming Methods:
 - a. RTP – RFC3550

- b. RTCP – RFC3550
- c. RTSP – RFC2326
- d. Unicast
- e. Multicast – RFC1112 Level 1

15. Time Synchronization:

- a. NTP – RFC1305
- b. Poll Rate: 1 per minute

16. Transport Layers:

- a. TCP – RFC973
- b. UDP – RFC768

G. Diagnostic Indicators

- 1. Network
- 2. Green LED: Power

H. Lens rotation:

Pan rotation angle	355°
Tilt angle	75°
Z-axis rotation	355°

I. Physical:

- 1. Dimensions (WxD): Ø 115 x 145 mm (4.2 x 5.7 in)
- 2. Weight: Approximately 1.0kg (2.20 lbs.)
- 3. Shipping Weight: Approximately 1.2 kg (2.64 lbs.)
- 4. Vandal Rating: IK10 (housing and lens cover)
- 5. Installation Type: Outdoor
- 6. Materials:
 - a. Housing: Aluminum Alloy
 - b. Other housing material: PC

J. Environmental:

- 1. Cold Start Temperature: -20°C to 60°C (-4°F to 140°F)
- 2. Operating Temperature: -40°C to 60°C (-40°F to 140°F)
- 3. Storage Temperature: -40°C to 60°C (-40°F to 140°F)
- a. Relative Humidity: 10 % to 95 % relative humidity with non-Condensing
- a. MTBF: 12.3 years

2.03 ACCESSORIES

A. Documentation:

- 1. Installation Guide

2. Quick Start Guide
 3. Regulatory
 4. Template
- B. Hardware:
1. 1 x Dome Camera
 2. 1 x Torx T10 Security L-Key
 3. 1 x Adaptor Plate (for use with pendant cap and electrical box)
 4. x 18mm screws & 3 x Plastic screw anchors
 5. 2 x 8 mm screws (for use with the pendant cap)
 6. 1 x Desiccant bag
 7. 1 x Plastic side cover
 8. 1 x Waterproof cap
 9. 1 x Waterproof rubber insert

END OF SECTION

PART 3 EXECUTION

3.01 INSTALLERS

- A. Contractor shall comply with all applicable state and local licensing requirements.
- B. Contractor shall demonstrate network and CCTV knowledge to the satisfaction of the Owner's representative.

3.02 EXAMINATION

- A. Submission of a proposal confirms that the contract documents and site conditions are accepted without qualifications unless exceptions are specifically noted.
- B. The site shall be visited on a regular basis to appraise ongoing progress of other trades and contractors, make allowances for all ongoing work, and coordinate the requirements of this contract in a timely manner.
- C. Inspect systems before installation for cosmetic defects or damage.

3.03 PREPARATION

- A. Prior to installation, the camera device and network shall be configured and tested to meet the specified requirements in accordance with the manufacturer's instructions.

3.04 INSTALLATION

- A. Contractor shall follow all Manufacturer's published installation guidelines for installing, programming, and testing of the camera.
- B. In order to ensure a complete, functional camera, for bidding purposes, where information is not available from the Owner upon request, the worst-case condition shall be assumed.
- C. Camera placement, pointing position, and configurations shall be coordinated with the Owner's representative, where appropriate.
- D. All necessary back boxes, racks, connectors, supports, conduit, cable, and wire must be furnished and installed to provide a complete and reliable camera installation. Exact location of all boxes, conduit, and wiring runs shall be presented to the Owner for approval in advance of any installation.
- E. All conduit, cable, and wire shall be installed parallel and square with building lines, including raised floor areas. Conduit fill shall not exceed forty percent (40%). All wires shall be gathered and tied up to create an orderly installation.
- F. The vandal-resistant network IP camera shall be installed within an indoor or outdoor environment and ceiling or wall mounted methods using provided or optional mounting accessory.
- G. Contractor ensures that the installed product contains the latest revision of Manufacturer's firmware.
- H. When the camera is part of a larger security system, the camera vendor must also be able to offer Professional Services that would deploy trained personnel to assist with the installation and programming of the camera.

3.05 TESTING AND CERTIFICATION

- A. Contractor shall demonstrate the functionality of the camera upon completion of installation, documenting the result of all tests and providing these results to the Owner.
- B. Contractor shall provide the necessary blank forms with instructions to fill in all the required data information that shall make up the information for the installed camera devices (location, installation position, make, model, IP address, username, password, image settings).
- C. Upon satisfactory on line operation of the camera devices, the entire installation including all subsystems shall be inspected. Contractor shall perform all tests, furnish all test equipment and consumable supplies necessary and perform any work as required to establish performance levels for the system in accordance with the specifications. Each device shall be tested as a working component of the completed system. All system controls shall be inspected for proper operation and response.
- D. Tests shall demonstrate the response time and display format of each different type of input sensor and output control device. Response time shall be measured with the system functioning at full capacity. Computer operation shall be tested with the complete data file.
- E. Contractor shall maintain a complete log of all inspections and tests. Upon final completion of system tests, a copy of the log records shall be submitted as part of the as-built documentation along with a letter of certification to indicate that the tests have been performed, and all devices are operational.
- F. The system test shall be witnessed by the Authority Having Jurisdiction. Any deficiencies noted during the testing must be corrected.
- G. A letter of certification shall be provided to indicate that the tests have been performed, and all devices are operational.
- H. The Owner's representative shall accept the system.

3.06 MAINTENANCE

- A. Preventative Maintenance Agreement during Warranty: As a separate price item, the Contractor shall provide preventative maintenance during the warranty period. Maintenance shall include, but no be limited to:
 - 1. Labor and materials, at no additional cost, to troubleshoot the camera devices.
 - 2. Labor and materials, at no additional cost, to provide test and adjustments to the camera devices.
 - 3. Regular inspections
- B. Preventative Maintenance Agreement: As a separate price item, the Contractor shall provide a complete Maintenance Agreement for a period of 12 months after the conclusion of the warranty period. The Maintenance Agreement shall include, but not be limited to:
 - 1. Labor and materials, at no additional cost, to troubleshoot the camera devices.
 - 2. Camera devices.
 - 3. Labor and materials, at no additional cost, to provide test and adjustments to the camera devices.
 - 4. Regular inspections.

3.07 STORAGE

- A. The product shall be stored in an environment consistent within the Manufacturer's published environmental ratings.

3.08 ATTACHED TABLES

- A. Table 1: Resolutions when Stream 1, Stream 2 and Stream 3, A maximum of 5 concurrent streams are supported by each camera, this includes shared streams.

Normal Mode						
		Resolution	Description	Max FPS		
				TWDR Off	TWDR 2x	TWDR 3x
Stream 1	h.264, h.265, h264+, h265+, MJPEG	2560x1920	4:3	30	25	15
		2560 x 1440 *1	16:9	30	25	15
		1920 x 1080	(1080p) 16:9	60	25	15
		1664 x 936	(HD+) 16:9	60	25	15
		1280 x 720	(720p) 16:9	60	25	15
Stream 2	h.264, h.265, h264+, h265+, MJPEG	1280 x 720	(720p) 16:9	30	25	15
		1024 x 576	(PAL+) 16:9	30	25	15
		800 x 600	(SVGA) 4:3	30	25	15
		816 x 464	16:9	30	25	15
		640 x 360	(nHD) 16:9	30	25	15
		480 x 272	16:9	30	25	15
Stream 3	MJPEG	800x448	16:9	15	15	15

Notes:

- *1 The default resolution of stream 1 will be 2560x1440
- *2 Stream 2 FPS is restricted to 15 FPS if stream 1 resolution is greater than 2560x1440
- A maximum of 5 concurrent streams are supported by each camera, this includes shared streams
- Corridor mode stream table is as above but without Stream 1 60 fps support for resolutions pf 1920x1080 or lower.

B. Table 3: Shutter Speeds

Shutter Speeds			
1/32,000 sec	1/5,000 sec	1/500 sec	1/60 sec
1/20,000 sec	1/4,000 sec	1/400 sec	1/30 sec
1/12,500 sec	1/2,500 sec	1/250 sec	1/15 sec
1/10,000 sec	1/1000 sec	1/200 sec	1/8 sec
1/8,000 sec	1/800 sec	1/120 sec	1/ 4 sec

C. Table 4: Menu Languages

Menu Languages			
Arabic	Dutch	Japanese	Spanish
Czech	English (US)	Korean	Turkish
Chinese (Simplified)	French	Polish	
Chinese (Traditional)	German	Portuguese	
Danish	Italian	Russian	

Table 4 – Menu Languages (Default = English US)

END OF SECTION