Oncam is a global technology company that delivers effective and intelligent video and video-based analytic and business intelligence solutions for our global customers. As a pioneer of 360-degree video technology and with over 10 years' experience, Oncam understands the need to intelligently integrate the business process with technology to create modern, scalable solutions. Oncam is part of Oncam Global inc and operates in multiple sectors across a diverse range of countries.

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180º 12 MEGAPIXEL INDOOR VIDEO CAMERA

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

Notes to Specifier

1. Where several alternative parameters or specifications exist, or where the specifier has the option of inserting text, such choices are presented in **<bold text>. The normal default is presented in [bracketed bold text].**

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

Important Note to Security Systems Specifiers

CSI MasterFormat 2016 incorporates numerous significant changes affecting electronic safety and security since MasterFormat 2014. This document is written to provide flexibility in using either format, although adoption of MasterFormat 2016 is encouraged. The following is a guide to the MasterFormat numbers relevant to the product referenced in this specification.

Primary Specification Area

MasterFormat 2014:

28 20 00	Electronic Surveillance
28 23 00	Video Surveillance
28 23 29	Video Surveillance Remote Devices and Sensors

MasterFormat 2016:

28 20 00	Video Surveillance
28 21 00	Surveillance Cameras
28 21 13	IP Cameras
28 21 13.11	Panoramic IP Cameras

Related Requirements

MasterFormat 2014:

27 20 00	Data Communications
28 23 13	Video Surveillance Control and Management Systems
28 23 16	Video Surveillance Monitoring and Supervisory Interfaces
28 23 19	Digital Video Recorders and Analog Recording Devices
28 23 23	Video Surveillance Systems Infrastructure

MasterFormat 2016

27 15 01.13	Video Surveillance Communications Conductors and Cables
27 20 00	Data Communications
28 05 07.21	PoE Power Sources for Electronic Safety and Security
28 05 11	Cyber Requirements for Electronic Safety and Security
28 05 19	Storage Appliances for Electronic Safety and Security
28 05 19.15	Network Video Recorders
28 05 33	Safety and Security Network Communications Equipment
28 23 00	Video Management System

180º 12 MEGAPIXEL INDOOR VIDEO CAMERA

PART 1 GENERAL

1.01 SUMMARY

A. Section includes a 12 megapixel (MP) IP indoor video camera providing 180-degree surveillance.

B. Product - A low profile 12 MP indoor video camera, employing one 4072H x 3046V image sensor, capable of providing 180-degree surveillance and up to six independent video streams.

C. Related Requirements

Refer to MasterFormat 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. API – Application Programming Interface
2. ARP – Address Resolution Protocol
3. AWB - Automatic White Balance
4. DHCP - Dynamic Host Configuration Protocol
5. DNS - Domain Name Server
6. fps - frames per second
7. FTP - File Transfer Protocol
8. GOP – Group of Pictures
9. GUI – Graphical User Interface
10. HTTP - Hypertext Transfer Protocol
11. HTTPS – Secure Hypertext Transfer Protocol
12. ICMP – Internet Control Message Protocol
13. IGMP - Internet Group Management Protocol
14. IP - Internet Protocol
15. JPEG - Joint Photographic Experts Group
16. MJPEG - Motion JPEG
17. MP - Megapixel
18. MPEG - Moving Pictures Experts Group
19. NTP - Network Time Protocol
20. PoE - Power over Ethernet
21. RTP - Real-Time Transport Protocol
22. RTSP - Real-Time Streaming Protocol
23. SDK - Software Development Kit
24. SMTP - Simple Mail Transfer Protocol
25. TCP - Transmission Control Protocol
26. UDP - User Datagram Protocol
27. UPnP -Universal Plug and Play

28. VCam – Virtual Camera
29. VMS - Video Management System
30. WDR – Wide Dynamic Range

B. Reference Standards
   1. Network
      a. IEEE 802.3 Ethernet Standards
      b. IEEE 802.1x – Port-based authentication
   2. Video
      a. ISO / IEC 14496 –10, MPEG-4 Part 10 (ITU H.264)
      b. ISO / IEC 10918 – JPEG
      c. ONVIF – Profile S
      d. PSIA
   3. Emissions
      a. FCC-47 CFR Part 15, Class A
      b. ANSI C63.4-2014, ANSI C63,4a 2017
      c. CE, UKCA
         1.) EN 55032:2015 + A11:2020 Class A Conducted and Radiated Power
         2.) BS EN55032:2015+A11:2020
         3.) EN 55024:2010+A1:2015 Immunity
         4.) BS EN 55024:2010+A1:2015
         5.) EN 50130-4:2011 + A1:2014 Immunity
      d. ISED ICES-003, Issue 7
      e. AS/NZS CISPR 32:2015 AMD1:2020, Class A Conducted and Radiated Power
   4. Safety
      a. Underwriters Laboratories (UL) and cUL62368-1:2014 – Information Technology Equipment

C. Definitions
   1. Dewarping – A process in which an image or set of images is rendered in a flat plane with spatial distortions corrected by a curvilinear type algorithm to create a normal appearance.
   2. Virtual Camera (VCam) – An image stream which is the result of taking a selected portion of a camera's field of view and presenting dewarped it as if it were a single camera dedicated to that view.

1.03 SUBMITTALS

A. Product Data
   1. Manufacturer's printed or electronic data sheets
   2. Manufacturer's installation and operation manuals
   3. Warranty documentation

1.04 QUALIFICATIONS

A. Manufacturer shall have a minimum of five years' experience in producing IP video equipment.

B. Installers shall be trained and authorized by the Manufacturer to install, integrate, test, and commission the system.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver the camera in the manufacturer's original, unopened, undamaged container with identification labels intact.

B. Store the camera in a temperature controlled environment protected from mechanical and environmental conditions as designated by the manufacturer.

1.06 WARRANTY AND SUPPORT

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

END OF SECTION

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Manufacturer: Oncam Global Ltd.
6th Floor,
2 London Wall Place,
London, EC2Y 5AU,
United Kingdom
Phone: + 44 (0) 20 7371 6640
Web: www.oncamgrandeye.com
E-mail: support@oncamgrandeye.com

B. Model EVO-180-WID (White)

C. Alternates: None

2.02 GENERAL DESCRIPTION

A. The 180º 12 MP indoor video camera shall be capable of providing 180-degree surveillance with no blind spots or stitching artefacts.

B. The 180-degree camera shall possess the following primary characteristics:

1. employ a single image sensor capable of providing 4072H x 3046V resolution
2. provide on-board dewarping software to convert the spherical video image into a continuous flat view
3. provide on-board dewarping software to convert the spherical video image into a panoramic view
4. H.264 and MJPEG compression
5. a controllable mechanical IR filter
6. 14 fps for maximum resolution, 30 fps for 2.2MP resolutions and below
7. unicast support up to 20 simultaneous users depending on the resolution settings
8. multicast supported for the H.264 main camera stream
9. 0.1 lux minimum illumination, providing clarity in low light
10. local 3D dewarping providing 4x VCams at max 1MP each including up to 2x panoramic at max 5.9MP
11. 10 configurable privacy regions
12. 8 configurable polygon Motion Detection regions
13. local alarm digital input and output

14. audio microphone input
15. built-in Micro SD Card slot. Supports cards up to 256 GB capacity. Speed class 10 or higher required
16. image snapshot transferred by email
17. operate on an embedded Linux platform
18. include a built-in web server
19. PoE (IEEE standard 802.af) or 12V powered

2.03 VIDEO

A. Imager
   1. Sensor: 12.4 MP (approximately) 1/2.3" Sony EXMOR R CMOS Sensor
   2. Minimum illumination: 0.10 lux (50 IRE, F/2.4)
   3. Scanning: Progressive

B. Image Control Settings
   1. Automatic white balance (AWB): 2,500K to 8,000K (approximately)
   2. Privacy zone definition: 10 configurable zones
   3. Wide Dynamic Range (WDR): Electronic WDR 60 dB
   4. Brightness
   5. Contrast
   6. Saturation
   7. Sharpen
   8. Exposure compensation
   9. Compression – image quality Multi-levels of compression and frame rate adjustment

C. Dewarping Mounting Modes
   1. Wall Mount, with additional controls:
      a. Invert image
      b. Auto-crop panorama to 180°
      c. Wall mount angle
      d. Scene offset angle

D. Lens:
   1. Angle of view: 187^{o} horizontal, 74^{o} vertical (Panoramic Stream)
      187^{o} horizontal, 162^{o} vertical (Fisheye Stream)

E. Video Streams
   1. The camera shall support the transmission of up to six configurable video streams, whose properties are detailed in Attachment A.
   2. Available compression types:
      a. H.264,
      b. MJPEG,
      c. Available resolutions:
         1.) Panoramic: H.264 compression
            a.) 3840 x 1536 (5.9 MP)
            b.) 3360 x 1344 (4.52 MP)

c.) 2560 x 1040 (2.60 MP)
d.) 1920 x 768 (1.47 MP)
e.) 1280 x 512 (0.66 MP)
f.) 800 x 320 (0.25 MP)

2.) VCAM H.264 Compression
a.) 1280 x 720 (1 MP)
b.) 640 X 480 (0.31 MP)

3.) Fisheye H.264 Compression
a.) 3360 x 3000 (10.1MP)
b.) 2688 x 2400 (6.45MP)
c.) 2240 x 2000 (4.48MP)
d.) 1568 x 1400 (2.20 MP)
e.) 1120 x 1000 (1.12 MP)
f.) 672 x 600 (0.40 MP)

4.) MJPEG compression
a) 672 x 600 (0.40 MP)

3. Bit rate
   a. Range: 0.8 Mbps – 10 Mbps (Constant Bit Rate)
   b. H.264 options:
      1) Constant Bit Rate
      2) Fixed Quality
      3) GOP length
      4) Maximum frames per second
   c. MJPEG options:
      1) maximum frames per second
      2) Fixed Quality
4. Frame rate: 0-30 fps
5. Presentation: Video views shall be available in both fisheye and dewarped (flat) views as follows:
   a. Fisheye views: 3 streams, one of which shall be MJPEG
   b. Dewarped views: 4 streams of independent VCams up to two of which can be Panoramic views
   c. Panoramic views: 2 streams, each capable of displaying a dewarped view of a full 180° panorama.
      1.) Means shall be provided to correct distortion in the panoramic view introduced when the camera is tilted downwards or upwards between +70 and -70° from horizontal.
      2.) Means shall be provided to electronically vary the vertical position of the panorama view with respect to the centre of the lens image
6. Video streams shall support ONVIF profile S.

F. Video Viewing
   1. Video and snapshots shall be capable of being accessed through the following means:
      a. JPEG images accessible through a web browser

b. Video streaming through an available media player
c. ONVIF driver

G. Storage and Recording
1. The 180-degree camera shall have the facility for onboard Micro SD card storage.

H. Video Motion
1. Video motion analytics shall be pre-loaded in the 180-degree camera.
2. The 180-degree camera shall have the ability to detect motion within up to 8 user defined areas of the video image.

2.04 ADDITIONAL FEATURES

A. Alarm – The 180-degree camera shall have a contact input and contact output for alarm or control.

B. Event management – The 180-degree camera shall perform selected response actions when triggered by selected inputs as follows:
1. Response actions:
a. contact output
b. e-mail via SMTP
c. local recording
d. Illuminate indicator LEDs
e. Operate Day/Night mode switch
2. Trigger inputs:
a. motion in a pre-defined area
b. hardware input
c. HTTP event via API commands
d. network connection lost

C. Audio – The 180-degree camera shall have audio capability.
1. Input options:
a. Line level/external microphone input using the I/O Connector; 600-ohm differential,
1 V p-p maximum
b. via RTSP using G.711 codec
c. via ONVIF Profile S

D. Integrations – The 180 degree camera shall fully conform to ONVIF Profile-S and have available an API to support integrations with third party manufacturers, including VMS and network storage providers.

2.05 NETWORK

A. Connectivity: 1000BASE-TX Ethernet with RJ-45 connector

B. Protocols supported
1. Transmission Control Protocol (TCP), Internet Protocol (IP) v4, User Datagram Protocol (UDP)
2. Configuration: Dynamic Host Configuration Protocol (DHCP)
3. Web services: Hypertext Transfer Protocol (HTTP)
4. Network services: Domain Name System (DNS), Network Time Protocol (NTP), Internet Control Message Protocol (ICMP), Universal Plug and Play (UPnP)
5. Media: Real-Time Transport Protocol (RTP), Real-Time Streaming Protocol (RTSP)

6. Multicast: Internet Group Management Protocol (IGMP)
7. Simple Mail Transfer Protocol (SMTP)

C. Unicast - The 180-degree camera shall support 20 simultaneous users of independent streams.

D. Multicast - The 180-degree camera shall support multicast for an H.264 main camera stream.

E. Security

1. The 180-degree camera shall require the user to set a username and password.

2.06 CAMERA SOFTWARE

A. Web Server - The 180-degree camera shall have a built in web server which supports browser-based configuration of the camera.

1. The camera's web server shall allow access to camera information and all primary software functions to include:
    a. Image settings
    b. Network settings
    c. Alarm settings, triggers, and actions
        1.) Triggers:
            a.) motion
            b.) network connection lost
            c.) hardware input
        2.) Actions:
            a.) Email (SMTP)
            b.) Record to SD card
            c.) Hardware Output
            d.) LED Output
            e.) IR Filter control
    d. Camera settings
        1.) Frames per second
        2.) Fixed Quality
        3.) Bit rate control
        4.) Compression settings
    e. Clock settings
    f. Video stream settings
        1.) Resolution
        2.) Compression
    g. SD card recording settings
    h. Factory reset
    i. Image regions
        1.) Privacy zones
        2.) Motion detection zones
2. The camera's web server shall support up to 20 clients simultaneously over the network.

B. Setup and Maintenance - The Manufacturer shall offer a setup and maintenance software tool to implement the following actions:

1. Scan local network to discover compatible cameras
2. Remotely change and configure camera settings, including network settings
3. Remotely import or export network settings
4. Upgrade camera firmware
5. Remotely send commands to camera

C. Diagnostics
1. The 180-degree camera shall have a self-monitoring function which automatically resets the camera in the event of malfunction.
2. The 180-degree camera shall have a diagnostics tool to test hardware functionality, accumulate statistics, and diagnose hardware faults.
3. The 180-degree camera's SD card shall allow the creation and storage of a boot-up function for diagnostics and fault finding.

2.07 ELECTRICAL

A. Power
1. Source Options
a. 12 VDC
b. PoE (IEEE standard 802.3af) – 48 VDC nominal
2. Power Consumption (maximum):
a. 12 VDC: 6.96 W
b. POE: 7.20 W

B. Connectors:
1. Ethernet: RJ-45 connector
2. External power (12 VDC): I/O Connector
3. External input/output: I/O Connector

2.08 MECHANICAL AND ENVIRONMENTAL

A. Housing Material: Polymer & aluminium
B. Anti-tamper: HEX security locking screw
C. Dimensions: 163 mm x 57 mm x 94 mm(6.4" x 2.2" x 3.7")
D. Temperature (operating and storage): 0° C to 40° C (32° F to 104° F)
E. Relative Humidity: 0 – 95% non-condensing

2.09 ACCESSORIES

A. The Manufacturer shall offer accessories to enable the following types of mounting:
1. Pendant
2. Pole
3. Wall
4. Corner

END OF SECTION

PART 3 EXECUTION

3.01 INSTALLERS

A. Contractor personnel shall comply with all applicable state and local licensing requirements.

3.02 PREPARATION

A. The network design and configuration shall be verified for compatibility and performance with the camera(s).

B. Network configuration shall be tested and qualified by the Contractor prior to camera installation.

C. Before permanent installation of the system, the Contractor shall test the system in conditions simulating the final installed environment

1. A report indicating successful test results shall be produced.

3.03 INSTALLATION

A. Contractor personnel shall follow all Manufacturer published installation instructions and guidelines.

B. The 180-degree camera shall not be deployed in air handling spaces.

C. Contractor shall insure that the installed cameras contain the latest revision of Manufacturer’s firmware

3.04 STORAGE

A. The 180-degree camera hardware shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.

3.05 ATTACHMENTS

A. Video Stream Properties

END OF SECTION

Attachment A

Video Stream Properties

Video	
Panoramic Stream 1	180° 3D Dewarped Panoramic Stream H.264 at: Up to 14 fps: 5.90 MP (3840x1536), 4.52 MP (3360x1344), 2.60 MP (2560x1024), 1.47 MP (1920x768). Up to 30 fps: 0.66 MP (1280x512), 0.25 MP (800x320).
Panoramic Stream 2	180° 3D Dewarped Panoramic Stream H.264 at: Up to 14 fps: 1.47 MP (1920x768). Up to 30 fps: 0.66 MP (1280x512), 0.25 MP (800x320).
Fisheye Stream 1	360° Fisheye Stream H.264 at: Up to 12 fps: 10.1 MP (3360 x 3000). Up to 14 fps: 6.45 MP (2688 x 2400), 4.48 MP (2240 x 2000). Up to 30 fps: 2.20 MP (1568 x 1400)
Fisheye Stream 2	360° Fisheye Stream H.264 at up to 30 fps: 0.40 MP (672x600)
Fisheye Stream 3	360° Fisheye Stream MJPEG at up to 30 fps 0.40 MP (672x600)
VCam Stream 1, 2, 3, 4	Up to 4 independent onboard 3D Dewarped Vcams H264 at: Up to 30 fps 1.00 MP (1280x720), 0.31 MP (640x480). VCam Streams 1 & 2 are replaced by Panoramic Streams 1 & 2, if those are enabled.
VCam Stream 1, 2, 3, 4 Compression	H.264 at 1.00 MP, 0.31 MP, up to 14 fps, (up to 30 fps in High Speed mode) Multi-levels of compression and frame rate adjustment
Multi-Stream Limitations	Not all stream combinations are permitted. Fisheye Stream 2 cannot be enabled when using Panoramic or VCam Streams. Enabling multiple streams simultaneously may reduce frame rates.
Image Control	Settings include brightness / contrast / saturation / exposure compensation, compression quality and wall / ceiling / table mount Manipulation of wall mount and scene angles to ensure a level horizon
Image Enhancement	Electronic WDR 60 dB
VMS / NVR Support	ONVIF Profile S Conformant – Contact Oncam Sales for an up-to-date VMS compatibility list
Web Browser Compatibility	Internet Explorer 11 with VLC plug-in required for full functionality.
Unicast	Up to 20 simultaneous users depending on the resolution settings
Multicast	Supported for H.264 main fisheye camera stream
Bit Rate Control	Options include Constant Bit Rate Control and Fixed Quality Control