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Digital Watchdog® is a leading manufacturer of security and surveillance solutions, offering stunning image quality, advanced hardware capabilities, reliable customer support, and the lowest total cost of deployment to the analog & IP megapixel surveillance markets. Located in Cerritos, CA with manufacturing facilities in Seoul, Korea, Digital Watchdog® is committed to delivering powerful security solutions to its customers worldwide.

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**MEGApix® Flex™ 16MP USER-CONFIGURABLE PANORAMIC DOME IP 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>.**

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

**Important: See further notes on the following page.**

**Important Note to Security Systems Specifiers**

CSI MasterFormat 2016 incorporates numerous significant changes affecting electronic safety and security. This document is written to provide flexibility in using either format, although the 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 2x xx Surveillance Cameras

28 2x xx IP Cameras

28 2x xx 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.xx Video Surveillance Communications Conductors and Cables

27 20 00 Data Communications

28 05 xx.xx PoE Power Sources for Electronic Safety and Security

28 05 xx Storage Appliances for Electronic Safety and Security

28 05 xx.xx Network Video Recorders

28 05 xx Cyber Requirements for Electronic Safety and Security

28 05 xx Safety and Security Network Communications Equipment

28 2x 00 Video Management System

**MEGApix® Flex™ 16MP USER-CONFIGURABLE PANORAMIC DOME IP CAMERA**

1. **GENERAL**
   1. **SUMMARY**
      1. The section includes a high-resolution 90o, 180o, 270o, and 360o user-configurable panoramic camera suitable for outdoor deployment.
      2. Product - A four-sensor, 16MP panoramic dome camera, with dual streaming H.264 and MJPEG capability in a vandal-resistant IP66-rated dome housing and capable of producing multiple zoom streams from a single master IP stream.
      3. Related Requirements
         1. 27 15 01.13 – Video Surveillance Communications Conductors and Cables
         2. 28 05 03 - Safety and Security Network Communications Equipment
         3. 28 05 19 – Storage Appliances for Electronic Safety and Security
         4. 28 06 20 - Schedules for Video Surveillance
         5. 28 23 00 - Video Management System
   2. **REFERENCES**
      1. Abbreviations
         1. AGC - Automatic Gain Control
         2. APIPA - Automatic Private IP Addressing
         3. ARP – Address Resolution Protocol
         4. AWB - Automatic White Balance
         5. BLC – Backlight compression
         6. DHCP - Dynamic Host Configuration Protocol
         7. DNR – Digital Noise Reduction
         8. DNS - Domain Name Server
         9. fps - frames per second
         10. FTP - File Transfer Protocol
         11. GOP – Group of Pictures
         12. GUI – Graphical User Interface
         13. HLC – Highlight Compensation
         14. HTTP - Hypertext Transfer Protocol
         15. ICMP – Internet Control Message Protocol
         16. IGMP - Internet Group Management Protocol
         17. IP - Internet Protocol
         18. JPEG - Joint Photographic Experts Group
         19. MJPEG - Motion JPEG
         20. MP - Megapixel
         21. MPEG - Moving Pictures Experts Group
         22. NTP - Network Time Protocol
         23. PoE - Power over Ethernet
         24. RTP - Real-Time Transport Protocol
         25. RTSP - Real-Time Streaming Protocol
         26. SMTP - Simple Mail Transfer Protocol
         27. SNMP – Simple Network Management Protocol
         28. TCP - Transmission Control Protocol
         29. UDP - User Datagram Protocol
         30. UPnP – Universal Plug and Play
         31. VMS - Video Management System
         32. WDR – Wide Dynamic Range
         33. ZeroConf – Zero Configuration Networking
      2. Reference Standards
         1. Network
            1. IEEE - 802.3 Ethernet Standards
         2. Video
            1. ISO / IEC 14496–10, MPEG-4 Part 10 ( ITU H.264)
            2. ISO / IEC 10918 – JPEG
            3. ONVIF–Profile S
         3. Emissions
            1. FCC-47 CFR Part 15 Class A
            2. EN55022: 1998 with A1: 2000, A2: 2003; Class A
            3. CISPR 22: 1997 with A1: 2000, A2: 2002; Class A
         4. Noise Immunity
            1. EN 55024: 1998 with A1: 2001, A2: 2003
            2. CISPR 24: 1997 with A1: 2001, A2: 2002
         5. Safety
            1. EN 60950-1: 2001 with A11: 2004
            2. IEC 60950-1: 2001
         6. Environmental
            1. ANSI / IEC60529 – Degrees of Protection Provided by Enclosures – IP66
      3. Definitions
         1. Virtual Camera – Operation deriving multiple scenes from one IP video stream, creating the appearance of multiple cameras.
         2. Zero Configuration Networking - is a set of technologies that automatically creates a usable computer network based on the Internet Protocol Suite (TCP/IP) when peripherals are interconnected, without requiring manual operator intervention or special configuration servers
   3. **SUBMITTALS**
      1. Product Data
         1. Manufacturer’s printed or electronic data sheets
         2. Manufacturer’s installation and operation manuals
         3. Warranty documentation
   4. **QUALIFICATIONS**
      1. The manufacturer shall have a minimum of five years of experience in producing IP video equipment.
      2. Installers shall be trained and authorized by the Manufacturer to install, integrate, test, and commission the system.
   5. **DELIVERY, STORAGE AND HANDLING**
      1. Deliver the camera in the manufacturer’s original, unopened, and undamaged container with identification labels intact.
      2. Store the camera in a temperature environment of -4°F to 122°F (-20°C to 50°C), protected from mechanical and environmental conditions as designated by the manufacturer.
   6. **WARRANTY AND SUPPORT**
      1. The manufacturer shall provide a 5-year warranty for the product to be free of defects in material and workmanship.

END OF SECTION

1. **PRODUCTS**
   1. **EQUIPMENT**
      1. Manufacturer: Digital Watchdog, Inc.

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* + 1. Model DWC-PVX16Wx

**Digital Watchdog model differences:**

**DWC-PVX16W2 includes 4x 2.8mm fixed lens modules, silver-color housing**

**DWC-PVX16W4 includes 4x 4.0mm fixed lens modules, silver-color housing**

**DWC-PVX16Wx base camera and add up to four (4) lens modules: 2.8mm, 4.0mm,**

**6.0mm, 8.0mm, silver-color housing**

**DWC-PVX16W2W includes 4x 2.8mm fixed lens modules, white-color housing**

**DWC-PVX16W4W includes 4x 4.0mm fixed lens modules, white-color housing**

**DWC-PVX16WxW base camera and add up to four (4) lens modules: 2.8mm, 4.0mm,**

**6.0mm, 8.0mm, white-color housing**

* + 1. Alternates: None
  1. **GENERAL DESCRIPTION**
     1. The 16MP Panoramic Weather-Resistant Camera (“panoramic camera”) shall employ four 4MP CMOS sensors to produce 90°, 180°, 270° and 360° user-configurable panoramic images at up to 30fps at 16MP via a single IEEE 802.3at compliant connection.
     2. The panoramic camera can be purchased with four (4) 4.0mm fixed lens modules, or it can be fully customizable with the camera base unit plus up to four (4) different lens modules. The panoramic camera’s modules do not need to be the same size.
     3. A single IP video stream from the panoramic camera shall be able to produce multiple zoom streams with virtual camera operation.
     4. The panoramic camera shall be housed in a vandal-resistant IP66-rated weatherproof enclosure, suitable for outdoor deployment.
     5. Each lens in the panoramic camera shall be motorized allowing for remote control of rotation and focus and shall have the ability to be tilted to accommodate specific heights and distances from the target.
     6. The panoramic camera shall be ONVIF Profile S compliant.
     7. The panoramic camera shall possess the following further characteristics:
        1. H.264and MJPEG compression, each derived from a dedicated encoder and capable of being streamed independently and simultaneously
        2. day/night operation with movable IR cut filters
        3. A low light level operation to 0.41 lux (color)
        4. 3D digital noise reduction
        5. built-in web server
        6. 4 Micro SD/SDHC/SDXC
        7. integral motion detection
        8. supports Zero Configuration Networking
        9. Wide Dynamic Range (WDR): 120 dB minimum
        10. multicast or unicast capable
  2. **VIDEO**
     1. Imager
        1. Sensors (4): 1/3" 4MP Sony CMOS
           1. pixels per sensor: 2688x1520
        2. Minimum illumination
           1. Color mode: 0.41 lux
        3. Image Control Settings shall be available for:
           1. Automatic white balance (AWB)
           2. Exposure modes: automatic or manual

In manual exposure mode, configurable settings for:

shutter mode: automatic or manual - 1/15 to 1/32000

slow speed: 1 ~ 1/5,1/7.5,1/10 seconds

backlight compensation (BLC)

WDR Level: 120 dB minimum

* + - * 1. Day and night settings, allow configuration for Day (color), Night (Black and White), or Automatic.
        2. Image mirror or flip
        3. Digital noise reduction
      1. Lenses (4): 4.0 mm fixed
         1. Angle of view

total: 360o

**2.8mm lens (DWC-PVXLMOD28): 90°**

**4.0mm lens (DWC-PVXLMOD4): 81°**

**6.0mm lens (DWC-PVXLMOD6): 51°**

**8.0mm lens (DWC-PVXLMOD8): 39°**

* + - * 1. Manual functions:

IR filter operation

* + - * 1. The lenses shall have the option for autofocus which will locate the sharpest image setting averaged over the entire individual scene and maintain lens focus position even after a reboot
    1. Video Streams
       1. The panoramic camera shall support two configurable video streams, each of which may have the following properties:
          1. Resolution: 4x 2688(H)X 1520(V)
          2. Streams:

Number: 4

Frames per second: 30fps

GOP size: user-controllable

* + - * 1. Compression type:

H.264

MJPEG, with controllable quality

* + - * 1. Bit rate: 100 Kbps – 10 Mbps, controllable for minimum and maximum
        2. Frame rates vs. resolution:

16 MP: up to 30 fps, per sensor

* + 1. Storage and Recording
       1. The panoramic control shall have onboard SD card storage.
          1. Card Type: 4 x Micro SDHC Class 10
       2. Local recording on the SD card shall commence upon loss of network connectivity, based on a pre-programmed schedule.
       3. The local SD storage shall have the ability to be backed up to alternate media without the removal of the SD card from the camera.
    2. Video streams shall be capable of supporting ONVIF protocol, profile S.
    3. Other
       1. Discovery - The manufacturer shall offer a discovery program to identify all devices of his manufacturer on the network.
       2. Access- The panoramic camera shall permit up to ten users to simultaneously access the camera.
  1. **NETWORK**
     1. Connectivity: 100/1000 Base-T Ethernet via RJ-45 connector
     2. Protocols supported
        1. Transmission Control Protocol(TCP), Internet Protocol (IP) v4 and v6, User Datagram Protocol (UDP)
        2. Configuration: Dynamic Host Configuration Protocol (DHCP)
        3. Web services: Hypertext Transfer Protocol (HTTP), Secure HTTP (HTTPS)
        4. Network services: Domain Name System (DNS), Network Time Protocol (NTP), Internet Control Message Protocol (ICMP), Simple Network Management Protocol (SNMP)
        5. Media: Real-Time Transport Protocol (RTP), Real-Time Streaming Protocol (RTSP)
        6. Notifications: File Transfer Protocol (FTP), Simple MailTransfer Protocol (SMTP), Telnet
     3. Flow Control. The panoramic camera shall support TCP and Layer 3 QoS protocols to control network congestion.
     4. DDNS – The Panoramic camera shall support DDNS services offered by the Manufacturer and other publicly available service offerings.
     5. Security
        1. The panoramic camera shall support IP address filtering whereby users can enter a list of allowed or blocked IP addresses for viewing video and configuring camera settings
        2. The panoramic camera shall provide three levels of user access with password protection.
  2. **ADDITIONAL FEATURES**
     1. Auxiliary Inputs and Outputs
        1. Input: Alarm sensor (contact closure)
        2. Output: Relay
     2. System Information
        1. The system settings of the panoramic camera shall be exportable as a separate file.
        2. The panoramic camera shall maintain an access log of the system and motion-triggered events.
           1. The log shall be exportable to an Excel spreadsheet file.
  3. **CAMERA SOFTWARE**
     1. The panoramic camera shall have a built-in web server that supports browser-based configuration using Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari.
     2. The software GUI shall allow access to camera information and all primary software functions, including:
        1. Camera network address
        2. Configuration
        3. Stream Control
        4. Screen snapshot, print and export
        5. Start and stop recording
     3. The Manufacturer shall offer video viewer and configuration tools to implement the following actions:
        1. Camera discovery
        2. Configuration and control
           1. imager:

active noise filter

localized exposure

back-light compensation

exposure control for ac lighting anti-flicker

advanced exposure settings

metering mode

metering area

exposure target factor

min and max shutter time settings

definable sensor gain control

focus control

day/night settings

* + - * 1. image:

saturation

brightness

hue

manual contrast

sharpness

auto digital WDR

auto contrast

white balance

* + - * 1. events and notifications

motion-related

* + - * 1. camera network parameters
        2. SD card storage recording management
        3. image capture, export, and print
      1. Viewer - view video streams through the web browser
      2. Image print and export
      3. Instant recording and playback
      4. Alerts
         1. e-mail setup
         2. define web addresses for notifications
      5. System
         1. firmware upgrade
         2. reset to factory default
         3. set date, time, and NTP server synchronization
         4. user access control
         5. View and export camera settings
         6. view system logs
    1. The panoramic camera shall be supported by Video Management Systems from the Manufacturer and third-party manufacturers.
  1. **ELECTRICAL**
     1. Power
        1. Sources
           1. 12 VDC
           2. PoE : IEEE802.3at,PoE+ Switch/ PoE+ Injector (PoE injector included)
        2. Power Consumption: 18W
        3. Ethernet: RJ-45connector
        4. External power (12 VDC): 2-wire pigtail
  2. **MECHANICAL AND ENVIRONMENTAL**
     1. Material:
        1. Housing: aluminum die-cast, vandal resistant
     2. Configuration: panoramic dome
     3. Dimensions (D x H): 7.55 in. x 3.3 in. (192mm x 84 mm)
     4. DWC-PVX16W Series Mounting Options:
        1. Ceiling MountBracket DWC-PZCM
        2. Wall MountBracket DWC-PZWM
        3. Corner Mount DWC-V1CNM (works with DWC-PZWM)
        4. Adapter for Parapet Mount DWC-PZADP
        5. Parapet Mount DWC-PZPARAM (DWC-PZADP required, sold separately)
        6. Pole Mount Bracket DWC-PMB-WL (works with DWC-PZWM)
     5. DWC-PVX16WxW Series Mounting Options:
        1. Ceiling MountBracket DWC-PZCMW
        2. Wall MountBracket DWC-PZWMW
        3. Corner Mount DWC-V1CNMW (works with DWC-PZWMW)
        4. Adapter for Parapet Mount DWC-PZADPW
        5. Parapet Mount DWC-PZPARAMW (DWC-PZADPW required, sold separately)
        6. Pole Mount Bracket DWC-PMB-WLW (works with DWC-PZWMW)
     6. Temperature:
        1. Operating
           1. standard: -4°F ~ 122°F (-20°C ~ 50°C)
     7. Humidity: 10 - 90%RH, non-condensing
     8. Environmental Rating: IP66

END OF SECTION

1. **EXECUTION**
   1. **INSTALLERS**
      1. Contractor personnel shall comply with all applicable state and local licensing requirements.
   2. **PREPARATION**
      1. The network design and configuration shall be verified for compatibility and performance with the camera(s).
      2. Network configuration shall be tested and qualified by the Contractor before camera installation.
   3. **INSTALLATION**
      1. The contractor shall follow all Manufacturer issued instructions for the installation of the product.
      2. 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.
   4. **STORAGE**
      1. The panoramic camera hardware shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.
   5. **ATTACHMENTS**
      1. Supported Third-Party VMS Systems

END OF SECTION