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Pelco understands that information is critical to success, which is why we are singularly focused on the development of video surveillance and security solutions that provide you the information necessary to make real-time, business-enabling decisions. From the recently introduced VideoXpert video management platform to our industry-leading selection of IP cameras and accessories, Pelco is committed to designing and delivering a broad range of high-quality, IP video security products and systems complemented with an unparalleled level of customer support and services.

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**4K IP PTZ OUTDOOR VIDEO CAMERA (Spectra Pro 4K Series)**

**DIVISION 28 – ELECTRONIC SAFETY AND SECURITY**

**28 20 00 Electronic Surveillance**

**28 23 00** **Video Surveillance**

**28 23 29 Video Surveillance Remote Devices and Sensors**

**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.

**4K IP PTZ VIDEO CAMERA**

1. **GENERAL**
   1. **SUMMARY**
      1. Section includes a 4K IP PTZ video camera with outdoor housing.
      2. Product – A 4K IP PTZ video camera, based on H.264, H.265, and MJPEG compression, capable of streaming up to 60 fps at resolutions up to 3840 x 2160, with dual streaming capability in an IP66 outdoor-rated housing.

## Related Requirements

* + - 1. 27 20 00 Data Communications
      2. 28 23 13 Video Surveillance Control and Management Systems
      3. 28 23 16 Video Surveillance Monitoring and Supervisory Interfaces
      4. 28 23 19 Digital Video Recorders and Analog Recording Devices
      5. 28 23 23 Video Surveillance Systems Infrastructure
  1. **REFERENCES**
     1. Abbreviations
        1. AGC - Automatic Gain Control
        2. API – Applications Programming Interface
        3. ARP – Address Resolution Protocol
        4. AWB – Automatic White Balance
        5. BLC – Back Light Compensation
        6. CBR – Constant Bit Rate
        7. CVBR – Constant and Variable Bit Rate
        8. DHCP - Dynamic Host Configuration Protocol
        9. DNR – Digital Noise Reduction
        10. DNS - Domain Name Server
        11. DDNS – Dynamic Domain Name Server
        12. EAP – Extensible Authentication Protocol
        13. fps - frames per second
        14. FTP - File Transfer Protocol
        15. GUI – Graphical User Interface
        16. HTTP - Hypertext Transfer Protocol
        17. HTTPS – Secure Hypertext Transfer Protocol
        18. ICMP – Internet Control Message Protocol
        19. IGMP - Internet Group Management Protocol
        20. IP - Internet Protocol
        21. JPEG - Joint Photographic Experts Group
        22. LDAP – Lightweight Directory Access Protocol
        23. MJPEG - Motion JPEG
        24. MPEG - Moving Pictures Experts Group
        25. NTP - Network Time Protocol
        26. PoE - Power over Ethernet
        27. PPPoE - Point-to-Point Protocol over Ethernet
        28. QoS – Quality of Service
        29. RARP – Reverse Address Resolution Protocol
        30. RTP - Real-Time Transport Protocol
        31. RTSP - Real-Time Streaming Protocol
        32. SMTP - Simple Mail Transfer Protocol
        33. SNMP – Simple Network Management Protocol
        34. SSH – Secure Shell
        35. SSL – Secure Sockets Layer
        36. TCP - Transmission Control Protocol
        37. UDP - User Datagram Protocol
        38. UPnP – Universal Plug and Play
        39. VBR – Variable Bit Rate
        40. WDR – Wide Dynamic Range
        41. VMS - Video Management System
        42. WDR – Wide Dynamic Range
     2. Reference Standards
        1. Network
           1. IEEE

802.3 Ethernet Standards

802.1x – Port-based authentication

* + - 1. Video
         1. ISO / IEC 14496 –10, MPEG-4 Part 10 (ITU H.264)
         2. ISO / IEC 10918 – JPEG
         3. ONVIF – Profile S, Profile T, Profile G, and Profile Q
      2. Emissions
         1. FCC-47 CFR Part 15, Class A
         2. CE, Class A
         3. ICES-003, Class A
      3. Environmental
         1. ANSI / IEC 60529 – Degrees of Protection Provided by Enclosures – IP66
         2. National Electrical Manufacturers Association, NEMA 250-2003, 4X Enclosure Definition
  1. **SUBMITTALS**
     1. Product Data
        1. Manufacturer’s printed or electronic data sheets
        2. Manufacturer’s installation and operation manuals
        3. Warranty documentation
  2. **QUALIFICATIONS**
     1. Manufacturer shall have a minimum of five years’ experience in producing IP video equipment.
     2. Installers shall be trained and authorized by the Manufacturer to install, integrate, test, and commission the system.
  3. **DELIVERY, STORAGE AND HANDLING**
     1. Deliver the camera in the manufacturer’s original, unopened, undamaged container with identification labels intact.
     2. Store the camera in a temperature environment protected from mechanical and environmental conditions as designated by the manufacturer.
  4. **WARRANTY AND SUPPORT**
     1. Manufacturer shall provide a limited 3 year warranty for the product to be free of defects in material and workmanship.

END OF SECTION

1. **PRODUCTS**
   1. **EQUIPMENT**
      1. Manufacturer: Pelco

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* + 1. Model Spectra Pro 4K Series

|  |
| --- |
| Spectra Pro 4K Environmental Pendant (8 MPx, 20x, light gray)  P2820-ESR |

* + 1. Alternates: None
  1. **GENERAL DESCRIPTION**
     1. The Spectra Pro 4K Series PTZ outdoor camera can see in absolute darkness. The infrared illumination (IR) has proportional brightness based upon zoom, creating visible pictures without any light up to 150 m from the camera. Spectra Pro is a high-speed PTZ, 20x, up to 8 MPx (4K) resoution camera series.
     2. The PTZ outdoor camera shall possess the following primary characteristics:
        1. Up to 4K resolution (2160p)
        2. Up to 30 images per second (ips) at 8 megapixels
        3. Variable speed/high speed pan/tilt drive unit with continuous 360° pan rotation up to 300°/sec (maximum pan speed) and up to 145°/sec (maximum tilt speed)
        4. H.264, H.265, and MJPEG compression
        5. Up to three simultaneous streams
        6. Day/night operation with IR cut filter
        7. 12 x digital zoom, 20X optical zoom
        8. Super resolution zoom mode
        9. Electronic Image Stabilizer (EIS)
        10. High Dynamic Range (HDR) mode, 72 dB
        11. IR illumination with proportional brightness based upon zoom
        12. Automatic Gain Control: 45 dB maximum
        13. Camera Sabotage and Motion analytics behaviors
        14. Pelco Smart Compression Technology
        15. PoE+ and 4PPoE capable
        16. Multicast or unicast capable with unlimited H.264 viewers
        17. Unicast capable with up to 5 simultaneous viewers
        18. Up to 2 TB Edge storage via Micro SDHC/SDXC card
        19. Audio input and output
        20. Alarm input and output
        21. IP66 rated housing
        22. IK10 except for glass; glass IK7
        23. Progressive scanning system
        24. 3 year warranty and support
  2. **CAMERA/OPTICS**
     1. Imager
        1. Sensor: 1 / 2.5" CMOS Sensor
        2. Aspect Ratio 16:9
        3. Light Sensitivity
           1. Color (33 ms): 1.0 lux (f/2.0-f/3.8)
           2. Color (125 ms) 0.3 lux (f/2.0-f/3.8)
           3. Mono (33 ms): **0**.5 lux (f/2.0-f/3.8)
           4. Mono (125 ms) 0.2 lux (f/2.0-f/3.8)
           5. Mono with IR 0.0 lux
        4. Day/Night Capabilities: Yes
        5. Shutter Range 1/4 ̴ 1/10,000 sec
        6. Signal-to-Noise Ratio >45 Db
        7. IR Cut Filter Yes
        8. Electronic Dynamic Range 72 dB
        9. Iris Control Auto iris with manual override
        10. Backlight Compensation Yes
        11. Automatic Gain Control Yes
        12. Active Noise Filtering 3D Noise Filtering
        13. Digital Image Stabilization Yes
  3. **VIDEO**
     + 1. Video Encoding H.264 High, Main, MJPEG, H.265 Main
       2. Video Streams Up to 3 simultaneous streams; the second and third stream is

variable based on the setup of the primary stream

* + - 1. Frame Rate Up to 60, 50, 30, 25, 20, 16.67, 15, 12.5, 10, 7.5, 5, 3, 2, 1

(depending on the coding, resolution, and stream configuration)

* + - 1. Available Resolutions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Resolution** | | | | **H.264 High Profile**  **(IP GOP Structure)** | |
| **MPx** | **Width** | **Height** | **Aspect Ratio** | **Maximum IPS** | **Recommended Bit Rate (kbps)** |
| 8 | 3840 | 2160 | 16:9 | 30 | 9500 |
| 6 | 3264 | 1840 | 16:9 | 30 | 9500 |
| 4 | 2688 | 1520 | 16:9 | 30 | 9000 |
| 2.07 | 1920 | 1080 | 16:9 | 60 | 10000 |
| 2.07 | 1920 | 1080 | 16:9 | 30 | 7000 |
| 0.92 | 1280 | 720 | 16:9 | 60 | 8100 |
| 0.92 | 1280 | 720 | 16:9 | 30 | 5100 |
| 0.59 | 1024 | 576 | 16:9 | 60 | 8000 |
| 0.59 | 1024 | 576 | 16:9 | 30 | 5000 |
| 0.52 | 960 | 540 | 16:9 | 60 | 7400 |
| 0.52 | 960 | 540 | 16:9 | 30 | 4900 |
| 0.23 | 640 | 360 | 16:9 | 60 | 4750 |
| 0.23 | 640 | 360 | 16:9 | 30 | 2350 |
| 0.06 | 320 | 180 | 16:9 | 60 | 2600 |
| 0.06 | 320 | 180 | 16:9 | 30 | 1400 |

* + - 1. Video streams shall be support ONVIF Profile S and Profile T.
      2. The PTZ camera shall have the following additional streams available:
         1. Low resolution JPEG stream for configuration of camera settings.
         2. Event stream displaying a list of alerts triggered by an active analytic behavior.
      3. Image Control Settings
         1. General Image Settings

Digital Zoom

Auto Focus

Digital Processing

* + - * 1. Camera Exposure

Priority

Flicker Correction

Backlight Compensation

HDR

Day/Night

* + - * 1. White Balance

Auto Mode

Manual Mode

* + - * 1. Window Blanking

Up to 16 blanked windows can be defined.

* + 1. Lens: F2.0 – F3.8, focal length 4.4 mm (wide)- 88.4 mm (tele)
       1. Horizontal angle of view: 70.2o (wide) – 4.1o (tele)
       2. Vertical angle of view: 42.1o (wide) – 2.3o (tele)
       3. Diagonal angle of view: 77.8o (wide) – 4.7o (tele)
    2. Storage and Recording
       1. The PTZ camera control shall have onboard SD card storage.
          1. Card type: Micro SDHC/SDXC
          2. Capacity: up to 2 TB
       2. The local SD storage shall have the ability to be backed up to alternate media without removal of the SD card from the camera.
       3. Local recording on the SD card shall commence upon loss of network connectivity, based on a pre-programmed schedule.
       4. Video shall be recorded continuously in the case of network outage.
       5. Alarm recording: The PTZ camera shall capture selectable 1, 5, or 10 second video clips on camera sabotage, motion detection, or alarm input.
       6. Video recording and storage shall support ONVIF profile G.
    3. Analytics
       1. Analytics shall be pre-loaded in the PTZ camera.
       2. Analytics behaviors:
          1. Camera Sabotage - Detection of contrast changes in the field of view, suitable to detect lens obstruction or unauthorized repositioning of the camera.
          2. Motion - Generates an alarm in a high traffic area when a person or object moves.
  1. **ADDITIONAL FEATURES**
     1. Alarm
        1. Unsupervised Detects open or closed alarm state
        2. Input Two alarms, 3.5 VDC maximum, 3.5mA maximum
        3. Relay Output: Two outputs, ±32 VDC maximum, 150mA maximum
     2. Audio – The PTZ camera shall have bi-directional audio capability.
        1. Input/Output Line level/external microphone input; 1 V p-p maximum signal level
        2. Streaming Embedded audio
     3. Discovery - Manufacturer shall offer a discovery program to identify all devices of his manufacture on the network.
     4. System Information
        1. The system settings of the PTZ camera shall be exportable as a separate file.
        2. The PTZ camera shall maintain an accessible log of system and motion-triggered events.
           1. The log shall be exportable to an Excel spreadsheet file.
  2. **NETWORK**
     1. Connectivity: 100 BASE-TX Ethernet with 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) v2c/v3, 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. Notifications: File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP)
        8. Remote Access: Secure Shell (SSH)
        9. Security: IEEE 802.1x (EAP-MD5, EAP-TLS, EAP-TTLS, EAP-PEAP and EAP-FAST)
        10. Quality of Service: IEEE 802.1p Layer 3 Differentiated Services Code Point (DSCP)
        11. ARP
        12. ICMP
     3. Users
        1. Unicast Up to 5 simultaneous users depending on resolution settings (2

guaranteed streams)

* + - 1. Multicast Unlimited users H.264 or H.265
    1. Security Access Password protected
    2. Secure Transmission Transport Layer Security (TLS 1.2)
    3. Software Interface Web browser view and setup
    4. Pelco System Integration VideoXpert, Digital Sentry 7.3 (or later)
    5. Open API ONVIF Profile G, Profile S, Profile T, and Profile Q
    6. Mobile Application Integrated to Pelco Mobile App
    7. Video Analytics Simple motion detection and camera sabotage
    8. Local Storage\* Micro SDHC/SDXC slot (card not included), up to 2 TB

\*Capture 1-5-10 second video clips on camera sabotage, motion detection, or alarm input; record video continuously in the case of network outage with option to overwrite. Access video through FTP protocol and ONVIF Profile G)

* + 1. Security
       1. The PTZ 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 PTZ camera shall provide three levels of user access with password protection.
       3. User authentication shall be available through a Lightweight Directory Access Protocol (LDAP) server.
    2. Minimum System Requirements
       1. Web Browser Google Chrome 61.0 (or later), Internet Explorer® 8.0 (or later), or

Firefox 3.5 (or later)

* + - 1. Required Systems for

Pelco Analytics

* + - * 1. Pelco Interface VideoXpert and Digital Sentry, WS5200 Advanced System Management

Software on an Endura 2.0 (or later) system

* + - * 1. Open API The Pelco API can transmit behavior alarm data to third-party

applications, available at pdn.pelco.com

* 1. **CAMERA SOFTWARE**
     1. Features:
        1. 256 presets
        2. 16 tours
        3. 4 patterns
        4. Field of View scan
        5. ±0.1º preset accuracy
        6. Multilanguage menus (English, Spanish, Portuguese, Italian, German, French, Russian, Turkish, Arabic, Simplified Chinese, and Korean)
        7. Password protection
        8. 16 window blanks, configurable in size
        9. “Auto Flip” feature rotates camera 180º at bottom of tilt travel
        10. Configurable park with actions
        11. Proportional pan/tilt continually decreases pan/tilt speeds in proportion to depth of zoom
        12. Pelco’s Smart Compression Technology lowers bandwidth and storage requirements by up to 70%. Our technology allows the user to make intelligent decisions regarding storage savings and image quality.
     2. The PTZ camera shall have a built in web server which supports browser-based configuration.
     3. The camera’s web server shall allow access to camera information and all primary software functions.
     4. The Manufacturer shall offer video viewer and configuration to implement the following actions:
        1. Camera connection
        2. Administration and configuration
           1. Live video
           2. PTZ control panel
        3. Settings
           1. System

Change the device name

Configure time settings

Set up text overlay

Get backup

Display system information

Update firmware version

* + - * 1. Network

Change the camera’s general network settings

Configure users

SSL settings

Enable SSH

Configure 802.1x port security settings

Choose SNMP Server

Firewall mode

Enable FTP

Activate VMS connectivity

* + - * 1. Imaging

Change the camera’s general image settings

Adjust the camera exposure

Program the white balance mechanism

Define window blanking

* + - * 1. PTZ

PTZ movements (pan, tilt, zoom, and focus)

Actions (Scan, Preset, Patrol, and Pattern)

* + - * 1. A/V Streams

Video configuration page

Audio configuration page

Local recording page

RTP settings

Smart Compression

* + - * 1. Events

Configure camera events and analytics

* + 1. Minimum System Requirements
       1. Processor: Intel® Core™ i3 Processor, 2.4 GHz
       2. Acceptable Operating Systems:
          1. Windows® 7 (32-bit and 64-bit) with DirectX® 11
          2. Mac OS X 10.4 (or later)
       3. Memory: 4 GB RAM
       4. Network Interface Card: 100 megabits (or greater)
       5. Monitor: Minimum 1024 x 768 resolution, 16- or 32-bit pixel color
       6. Acceptable Web Browsers:
          1. Google Chrome 61.0 (or later)
          2. Internet Explorer® 8.0 (or later)

**Internet Explorer 8.0 (or later) is recommended for configuring analytics**

* + - 1. Acceptable Media Players:
         1. Pelco Media Player
         2. QuickTime 7.6.5 for Windows 7
         3. QuickTime 7.6.4 for Mac OS X 10.4 (or later)
    1. The Manufacturer shall offer a mobile application with the capability to access live video from up to 500 cameras.
    2. The Manufacturer shall offer an open API.
  1. **ELECTRICAL**
     1. Ports RJ-45 connector for 100Base-TX Auto MDI/MDI-X
     2. Cabling Type Cat5e or better for 100Base-TX
     3. Input Voltage 21 to 32 VAC; 24 VAC nominal,

38 to 57 VDC; 48 VDC nominal

* + 1. Input Power
       1. 24 VAC 1.35 A (32 VA) maximum (without IR, PTZ, and heater);

3.3 A (72 VA) maximum (with IR, PTZ, and heater)

* + - 1. 48 VDC 0.53 A (26 W) maximum (without IR, PTZ, and heater);

1.2 A (62 W) maximum (with IR, PTZ, and heater)

* + - 1. 802.3bt (56 V) 0.46 A (26 W) maximum (without IR, PTZ, and heater);

1.2 A (67 W) maximum (with IR, PTZ, and heater)

* 1. **MECHANICAL AND ENVIRONMENTAL**
     1. Housing Material: Aluminum
     2. Configuration: Environmental pendant (includes sun shield, heater, and blower)
     3. Color Light gray, RAL 7047
     4. Cable Entry (Back Box)
        1. Pendant Through 1.5-inch NPT pendant mount
     5. Weight Unit Shipping
        1. Environmental Pendant 5.2 kg (11.5 lb) 6.2 kg (13.7 lb)
     6. Effective Projected Area\*
        1. Without mount 63.5 square inches
        2. With IWM Series mount 109.8 square inches

\*0.8 drag coefficient assumed. Air temperature and wind velocity impact drag coefficient assumed. Air temperature and wind velocity impact drag coefficient so if a more accurate EPA is required, then the drag coefficient must be determined experimentally.

* + 1. Clock Real time clock
    2. IR Wavelength 850 nm
    3. IR Range 150 m
    4. Optical Zoom 30X
    5. Digital Zoom 32X
    6. Variable Speed 0.1º to 100º/sec (manual pan speed)
    7. Preset Accuracy ±0.1º
    8. Pan Movement 360º continuous pan rotation
    9. Vertical Tilt +15º to -90º degrees
    10. Maximum Pan Speed Up to 300º per second
    11. Maximum Tilt Speed Up to 145º per second
    12. Manual Pan/Tilt Speeds
        1. Pan 0.1º to 100º/sec manual operation
        2. Tilt 0.1º to 50º/sec manual operation
    13. Preset Speeds
        1. Pan 300º/sec
        2. Tilt 145º/sec
    14. Temperature:
        1. Operating Temperature:

|  |  |
| --- | --- |
| **Temperature** | **Environmental Pendant** |
| Maximum | 60ºC (140ºF) |
| Minimum | -40ºC (-40ºF) |
| Cold Start | -40ºC (-40ºF) |
| Storage Temperature | -40ºC to 60ºC (-40ºF to 140ºF) |

* + 1. Operating Humidity: 0 to 90%, RH condensing (Environmental Pendant)
    2. Environmental Rating: Type 4X and IP66
  1. **ACCESSORIES**
     1. Recommended Mounts:
        1. IWM-SR, IWM24-SR: Wall mount, with or without integral 24 VAC, 100 VA transformer; can be

adapted for corner, parapet, or pole application

* + - 1. WMVE-SR: Environmental wall mount; can also be mounted using a pole
      2. PP350/PP351 Spectra camera parapet; wall/rooftop mount
    1. Power Supplies:
       1. WCS1-4 Model (WCS Series)

Single 24 VAC camera power supply, indoor

* + - 1. ECPS-48VDC-5A 48 VDC indoor power supply
      2. POE90U1BT-EUK 90 W HPOE 802.3BT single port injector EU and UK power cord

included

* + - 1. POE90U1BT-US 90 W HPOE 802.3BT single port injector US power cord included
      2. POE90U1BT 90 W HPOE 802.3BT single port injector power cord not included
  1. **CERTIFICATIONS**
     1. CE, Class A
     2. FCC, Class A
     3. ICES-003, Class A
     4. UL/cUL Listed
     5. RCM
     6. KC
     7. ONVIF S, ONVIF G, ONVIF Q, ONVIF T
     8. IEC 62676 Part 5
     9. Environmental models meet Type 4X and IP66 standards when installed properly

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 prior to camera installation.
   3. **INSTALLATION**
      1. 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 PTZ camera hardware shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.

END OF SECTION