ARCHITECT & ENGINEER SPECIFICATIONS

SECTION 28 23 29
VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS

SNC-DH110

Compact, High Definition (HD), Electrical Day/Night, Minidome Network Camera
(Software version 1.82.01 or later)

PART 2 – PRODUCTS

2.01 NETWORK CAMERA SPECIFICATIONS

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A. MAIN FEATURES:

1. Compact, High Definition (HD), Electrical Day/Night, Minidome Network Camera

2. Compact and stylish design for discreet surveillance solution.

3. 720p HD picture quality (1280 x 960 pixels maximum resolution), supporting H.264 at 30 fps (IP)

4. 3 compression formats (H.264, MPEG-4, JPEG) and dual streaming capability

5. Minimum scene illumination of 5.0 lx (50 IRE [IP], AGC 30 dB) and 2.7 lx (30 IRE [IP], AGC 30 dB) at either 16:9 or 4:3 aspect ratio mode.

6. Exmor CMOS:
   This sensor shall realize high quality and low noise images.

7. Intelligent Motion Detection (IMD):
   This feature shall be able to minimize the number of false alarms by eliminating environmental noise such as trees moving, ripples in water, reflection from wet roads and gain noise to name but a few. This is very different to other manufacturers that typically compare just two frames together. This camera compares 15 frames together, which ensures that only ambiguous objects moving can trigger a real alarm.
   As a result, this enables end users to focus on real events, not suffer from loss of attention and quickly locate video that has been recorded upon alarm activations.

8. Distributed Enhanced Processing Architecture (DEPA):
   This technology is an edge based intelligent video analytics. It introduced the ability to work with five different filters enabling the detection of a moving object: appearing; disappearing; staying in an area longer than a pre-defined time; the number of moving objects and the direction an object is moving across a virtual trip wire.
   The camera captures the moving images, and analyze the video to determine the size and location of the moving object, and packages this information up as a metadata, and then streams the metadata over the network. The recorder receives the metadata and applies one of five filters to determine when an alarm condition is met.

9. The camera shall be compliant with the Open Network Video Interface Forum Profile S (ONVIF Profile S) conformance.

B. CAMERA:

1. The camera shall utilize a 1/3.8-type, CMOS sensor.
2. The number of effective pixels shall be approx. 1.3 Megapixels.
3. The analog video output of the camera shall be selectable from either the NTSC or PAL standards.
4. Camera synchronization shall be Internal.
5. The camera shall require a minimum scene illumination of: 5.0 lx (50 IRE [IP], AGC 30 dB) and 2.7 lx (30 IRE [IP], AGC 30 dB) at either 16:9 or 4:3 aspect ratio mode.
6. The camera shall have an AGC capability of up to 30 dB.
7. The camera shall have the following 7 gamma compensation modes:

   -Standard: Can be used for various scenes.

   -Scene 1: Brings out dark areas without losing details in the bright portions of the scene with high contrast.

   -Scene 2: Similar to Scene 1 but more effective than Scene 1.

   -Scene 3: Brightens up dark areas of a scene with high contrast.

   -Scene 4: No gamma compensation (linear)

   -Scene 5: Prevents overexposure when shooting objects are extremely bright.

   -Scene 6: Is used when a 1.8 gamma display system is used.
8. The electronic shutter speed shall be set from 1/2 to 1/10,000 second.
9. The camera shall have a BLC (Backlight Compensation) capability.
10. White balance shall be ATW (approx. 2000 K to 10000 K), ATW-PRO (approx. 3000 K to 5800 K), Fluorescent lamp, Mercury lamp, Sodium Vapor lamp, Metal Halide lamp, White LED, One push WB, or Manual.
11. The camera shall have a fixed focal lens.

12. The viewing angle shall be:
    Horizontal: 80.7˚.

13. The focal length shall be 2.34 mm.

14. The aperture range for the lens (F number) shall be F 2.8.

15. The camera lens shall be capable of adjusting pan and tilt angle after installation. The pan range shall be approx. 340˚ and the tilt range shall be 0˚ to 57˚.

16. The camera shall support up to 16 preset position tours for each of the 2 image compression formats. Up to 5 tours shall be supported.

C. CAMERA FEATURES:

1. The camera shall have an e-flip function, which can be used to invert an upside-down image so that it is displayed in the proper orientation.

2. The camera shall support an ON/OFF selectable NR (Noise Reduction) capability.

3. The camera shall have a superimpose capability for the following information:

   - Camera ID of up to 20 alphanumeric characters or logo in gif format

   - Date/Time data with selectable formats such as year-month-day, hour-minute-seconds; and day-month-year, hour-minutes-seconds

   - Zoom ratio (digital)

   - Actual frame rate (fps) and bit rate (bps)

   - Preset position name of up to 32 alphanumeric characters

   - Event -- sensor IN, IMD, camera tampering detection

   - Character string of up to 61 alphanumeric characters

   Font size of the superimposed data shall be user configurable for large, medium or small. Superimpose position shall be 4 corners, top, bottom, or center of the screen for a total of 7 selectable positions.

4. The camera web browser shall support the following languages: English, Japanese, Simplified Chinese, Traditional Chinese, Korean, Portuguese, French, Spanish, German, and Italian.

5. The camera shall have a Smartphone viewer, which can display the camera image and operate Pan/Tilt/Zoom (PTZ) on the smartphone.

D. VIDEO:

1. The camera shall utilize JPEG, MPEG-4 and H.264 compression.

   There are 2 aspect ratio modes to choose from when installing a camera: 16:9 (default) or 4:3.
   The supported resolutions in 16:9 and 4:3 mode are shown in the following:

   ○: Configurable.
   △: Configurable only when Image 1 is this image size.
   ×: Not configurable

Aspect ratio: 4:3

	Image 1	Image 2
1280 x 960	○	△
1280 x 800	×	×
1280 x 720	×	×
1024 x 768	○	△
1024 x 576	×	×
800 x 600	○	△
800 x 480	×	×
768 x 576	○	△
720 x 576	○	△
704 x 576	○	△
720 x 480	○	△
640 x 480	○	○
640 x 368	×	○
384 x 288	○	○
352 x 288	○	○
320 x 240	○	○
320 x 192	×	○
176 x 144	○	○

Aspect ratio: 16:9

	Image 1	Image 2
1280 x 960	×	×
1280 x 800	×	×
1280 x 720	○	△
1024 x 768	×	×
1024 x 576	○	△
800 x 600	×	×
800 x 480	○	△
768 x 576	×	×
720 x 576	×	×
704 x 576	×	×
720 x 480	×	×
640 x 480	×	○
640 x 368	○	○
384 x 288	×	○
352 x 288	×	○
320 x 240	×	○
320 x 192	○	○
176 x 144	×	○

When SolidPTZ is set to On, selectable image sizes are as follows.
○: Configurable.
△: Configurable when SolidPTZ of Image 2 is set to Off.
×: Not configurable

	Image 1	Image 2
768 × 576	○	×
720 × 576	○	×
704 × 576	○	×
720 × 480	○	×
640 × 480	○	○
640 × 368	×	△
384 × 288	○	○
352 × 288	○	○
320 × 240	○	○
320 × 192	×	△
176 × 144	○	○

2. The camera shall support the following compression formats: JPEG, MPEG-4 and H.264.

3. The camera is compliant with the SMPTE 296M in terms of number of pixels (1280 x 720) and 16:9 format.

4. The maximum frame rate capability of the camera over LAN shall be 30 frames per second at either 1280 x 960 or 1280 x 720 resolution in any of the 3 codecs (H.264/MPEG-4/JPEG).

5. The camera shall be capable of image cropping in all compression formats, such that only the area of interest is transmitted, to reduce bandwidth and file storage requirements.

6. The camera shall support electronic pan/tilt/zoom or e-PTZ, when 4:3 mode is selected. This function shall be supported in both dual streams; image 1 and image 2.

7. The camera shall support up to 8 preset e-PTZ positions for each of the 2 compression formats.

8. The camera shall be capable of streaming 2 standard definition (VGA) images at the same time during e-PTZ mode, where one of the streams is a scaled down image, while the other is a cropped VGA image. Both images shall be selectable from any of the 3 compression formats; H.264/MPEG4/JPEG.

9. The camera shall have an Adaptive Rate Control (ARC) function when using MPEG-4 and H.264 compression.
   This function when enabled, shall allow the camera to maintain the frame rate at a reduced image quality when network congestion

occurs. Should network bandwidth become further restricted, the frame rate shall then drop automatically to a suitable speed to maintain image integrity.

10. The camera shall be capable of limiting the bandwidth from 64 kbps to 8 Mbps in MPEG-4 or H.264, and from 0.5 Mbps to an unlimited bandwidth in JPEG.

11. JPEG compression levels shall be user selectable in 10 levels of compression ratios, based on an image of 24 bits per picture element (8 bits each for YUV).

12. Constant bit rate algorithm for JPEG data:
    The camera shall be capable of equalizing JPEG data sizes to have stable bandwidth utilization. Data size for each compression level is as follows:

level	C	QVGA		VGA		720p		QuadVGA	
		W	H	W	H	W	H	W	H
		320	240	640	480	1280	720	1280	960
1	1/60	3.8		15		45		60	
2	1/50	4.5		18		54		72	
3	1/40	5.6		23		68		90	
4	1/35	6.4		26		77		103	
5	1/30	7.5		30		90		120	
6	1/25	9.0		36		108		144	
7	1/20	11.3		45		135		180	
8	1/15	15.0		60		180		240	
9	1/10	22.5		90		270		360	
10	1/6	37.5		150		450		600	

Unit: kB

13. Actual frame rate in JPEG shall be shown in the following table:

Aspect ratio mode: 4:3 (image 2: OFF)

Resolution	1280 x 960		1024 x 768		800 x 600		768 x 576		640 x 480		320 x 240	
Image Quality Level	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual
1	30	30	30	30	30	30	30	30	30	30	30	30
2	25	25	30	30	30	30	30	30	30	30	30	30
3	20	20	30	30	30	30	30	30	30	30	30	30
4	16	16	30	30	30	30	30	30	30	30	30	30
5	16	16	25	25	30	30	30	30	30	30	30	30
6	12	12	20	20	30	30	30	30	30	30	30	30
7	10	10	16	16	25	25	30	30	30	30	30	30
8	8	8	12	12	20	20	20	20	30	30	30	30
9	5	5	8	8	12	12	15	15	20	20	30	30
10	3	3	5	5	8	8	8	8	12	12	30	30

Aspect ratio mode: 16:9 (image 2: OFF)

Resolution	1280 x 720		1024 x 576		800 x 480		640 x 368		320 x 192	
Image Quality Level	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual	Frame Rate Setting	Frame Rate Actual
1	30	30	30	30	30	30	30	30	30	30
2	30	30	30	30	30	30	30	30	30	30
3	25	25	30	30	30	30	30	30	30	30
4	25	25	30	30	30	30	30	30	30	30
5	20	20	30	30	30	30	30	30	30	30
6	16	16	25	25	30	30	30	30	30	30
7	12	12	20	20	30	30	30	30	30	30
8	10	10	16	16	25	25	30	30	30	30
9	6	6	10	10	16	16	25	25	30	30
10	4	4	6	6	10	10	16	16	30	30

14. The camera shall have the capability of simultaneously encoding up to 2 of the following compression formats in any combination, including multiple instances of the same compression format: JPEG, MPEG-4, and/or H.264.

    The maximum frame rates of each combination which are calculated are shown in the following tables:

1st			2nd [frame rate]			
codec	size	frame rate	size	H.264	MPEG	JPEG
H.264	1280×720	30	176×144	NA	NA	NA
		25	640×480	15	20	30
			640×368	20	25	30
MPEG4	1280×720	30	640×480	20	30	30

1st			2nd [frame rate]			
codec	size	frame rate	size	H.264	MPEG	JPEG
H.264	1280×960	30	640×480	6	8	12
			640×368	8	10	16
			384×288	16	20	30
			352×288	16	20	30
			320×240	25	30	30
H.264	1280×960	25	640×480	20	25	30
			640×368	25	30	30
MPEG4	1280×960	30	640×480	3	4	6
			640×368	4	5	8
			384×288	8	10	16
			352×288	8	12	16
			320×240	12	16	25
			320×192	16	20	30
MPEG4	1280×960	25	640×480	16	20	30
			640×368	20	30	30
H.264	1024×768	30	640×480	12	16	25
			640×368	16	20	30
H.264	1024×768	25	640×480	25	30	30

15. The camera shall be capable of supporting up to 5 users simultaneously over the network.

16. The camera shall have up to 6 user level settings.
    The administrator shall have complete access/control of the cameras. The other 5 levels of access can be set to limit user privileges to functions such as viewing, changing image size, etc. Access to functions shall be determined as shown in the following table:

Function	Administrator	User				
		Full	Pan/Tilt	Preset position	Light	View
Monitor a live image	●	●	●	●	●	●
View the date and time	●	●	●	●	●	●
Control the frame rate (JPEG mode only)	●	●	–	–	–	–
Control the image view size	●	●	●	●	●	–
Save a still image and movie in the computer	●	●	●	●	●	–
Send an image file to the FTP server	●	●	–	–	–	–
Send an image attached to an e-mail	●	●	–	–	–	–
Switch the Day/Night function mode	●	●	–	–	–	–
Switch the TCP/UDP transmission mode (Available in MPEG4/H.264 mode only)	●	●	–	–	–	–
Call the preset position	●	●	●	●	–	–
Perform the pan/tilt/zoom operation	●	●	●	–	–	–
Select the codec mode	●	●	●	●	●	–
Control the setting menu	●	–	–	–	–	–

● Usable function
– Not usable function

E. INTELLIGENT VIDEO ANALYTICS:

1. The camera shall incorporate a built-in unique Intelligent Motion Detection (IMD) capability that supports Distributed Enhanced Processing Architecture (DEPA) technology.
   To minimize false triggers, this Intelligent Motion Detection shall compare the current image with prior 15 frames within the camera. This algorithm shall allow the camera to discriminate against some environmental noise such as shaking leaves or Auto Gain Control maximum rate noise.

2. The camera shall have a camera tampering detection function that alerts the operator if the camera is tampered with. Tampering can include spraying of the camera lens, covering it with a cloth, or changing of the mounting direction.

F. AUDIO:

None

G. SYSTEM REQUIREMENTS & NETWORK:

1. The supported operating systems shall be Microsoft Windows 8 Pro* 32 bit and 64 bit, Microsoft Windows 7 32 bit/64 bit (Ultimate/Professional), Microsoft Windows Vista 32 bit (Ultimate/Business), Microsoft Windows XP 32 bit (Professional), and Microsoft DirectX 9.0c or higher
   *Software version 1.79 or later.

2. Minimum PC requirements shall be the Intel Core2 Duo Processor, 2 GHz or higher, with 1 GB RAM or more supporting 1600 x 1200 or higher resolution, 24-bit True Color display capability with Ethernet 100Base-TX.

3. The camera shall incorporate a built-in web server, such that the standard web browser Microsoft Windows Internet Explorer (version 6.0, 7.0, 8.0, 9.0 or 10.0 recommended) can be used to access the camera without need for special viewer software.

4. The following web browsers can also be used to access the camera with the ‘Plug-in Free’ viewer: Firefox version 3.5, Safari version 4.0 and Google Chrome version 4.0. When using these browsers, the video is displayed in JPEG format.

5. The ‘Plug-in Free’ viewer also supports the Flash plug-in and ActiveX viewer, the latter allowing for MPEG-4 and H.264 video streams.

6. The camera shall support ActiveX viewer which allows the camera image to be viewed in Internet Explorer.
   The ActiveX viewer allows for recording of video directly to the PC’s hard drive.

7. The camera shall be capable of generating HTML code for the video image, allowing for easy web page integration.

8. The camera shall support Windows Desktop Gadgets and shall allow for the ActiveX viewer to be modified.

9. The camera shall support the following network protocols:
   IPv4, IPv6, TCP, UDP, ARP, ICMP, IGMP, HTTP, HTTPS, FTP (client only), SSL, SMTP, DHCP, DNS, NTP, RTP/RTCP, RTSP (IPv4 only), and SNMP (v1, v2c, v3).
   Network security shall be via password (basic authentication) and IP filtering.

10. The camera shall have the capability to stream MPEG-4 and H.264 video in TCP protocol or MPEG-4 and H.264 in UDP (unicast/multicast) protocol.

11. The camera shall be capable of deterring brute force attacks. The camera shall recognize a brute force attack and refuse HTTP requests from an attacker's IP address for a preconfigured number of seconds. The camera shall determine that a brute force attack occurred when a client authentication error occurs 5 consecutive times.

12. The camera shall be capable of dynamic IP address change notification. It shall accomplish this via an email to a specified address or by HTTP when its IP address changes.

13. The camera shall support HTTPS client authentication.

14. The camera shall have an FTP client capability which allows the following:

    - Transferring a JPEG image to a pre-specified FTP server when an alarm is triggered by either motion detection, camera tampering detection or sensor input.

    - Periodically capturing a JPEG image and transferring it to the FTP server.

15. The camera shall have an email (SMTP) notification capability which allows the following:

    - Sending an email to pre-specified users when an alarm is triggered by either motion detection, camera tampering detection or sensor input. A JPEG image, which is linked with the alarm trigger, can be attached to the email.

    - Periodically capturing a JPEG image and sending it via email.

16. The camera shall support RTSP (IPv4) protocol based upon RFC 2326 and shall support the following options: DESCRIBE, SETUP, PLAY, TEARDOWN, and GET_PARAMETER.

17. The camera shall support National Transportation Communications for ITS (NTCIP) protocol.

18. The camera shall support QoS technology using Differentiated Services Code Point (DSCP).

19. The SNC toolbox software includes the IP Setup (including group camera management) program, Firmware Upgrade Tool, Custom Homepage Installer, and Group Camera Setting Scheduler.
    The SNC toolbox shall be supplied with the camera as a standard accessory in the CD-ROM.

20. The camera shall support IP Filtering, whereby access to the camera can be restricted to one or more groups of selected users. Up to 10 different groups can be established by defining an IP address range for each group.

21. The camera shall support IEEE 802.1X authentication, and shall:

    - comply with the IEEE 802.1X standards,

    - be capable of being integrated into an IEEE 802.1X network to achieve high network security,

    - support EAP-TLS mode to use a key pair from a Certificate Authority (CA),

    - support EAP-MD5 mode,

    - support PEAP mode.

22. The camera shall have user configurable port settings.

23. Upon CGI command request, system log shall be recorded on a built-in memory (non volatile memory).

24. The recording software (RealShot Manager Lite) shall also be supplied with the camera as a standard accessory in the CD-ROM.

H. INETERFACES:

1. The camera shall have a composite analog video output in addition to streaming video via Ethernet.
   The composite analog video output can be used for monitoring while installing the camera to adjust the field of view and focus.

2. The composite analog video output shall be 1.0 V peak-to-peak @ 75 ohms.

3. The composite analog video output shall be an AV mini jack type connector.

4. The camera shall have an RJ-45 socket accessible via pigtail.

5. The network interface shall be via an 8-pin RJ-45 connector, 10Base-T/100Base-TX Ethernet.
   Both IPv6 and IPv4 are supported.

6. The camera shall have a 2-pin I/O interface located on the bottom of the camera that is accessible via a supplied cable.
   There shall be an alarm input port.
   The alarm input port shall be opto-isolated.

7. The camera shall support 1 optically isolated sensor input. The interface shall be via a a supplied cable.

8. The camera shall provide a sensor input port for interfacing with external equipment.
   The sensor input shall be configurable for either ‘make contact’ or ‘break contact’ configuration.

9. IO assignment: I/O Port

Sensor input cable color	Signal
Red	Sensor input+
White	Sensor input– (GND)

I. GENERAL SPECIFICATIONS:

1. The camera input power shall be Power over Ethernet (PoE) (IEEE 802.3af compliant) and the power classification shall be Class1.

2. Power consumption for the camera shall be 2.4 W maximum.

3. The camera operating temperature shall be within the following range:
   +32 ˚F to +122 ˚F (0 ˚C to +50 ˚C)

4. The camera storage temperature shall be within the following range:
   -4 ˚F to +140 ˚F (-20 ˚C to +60 ˚C)

5. The camera operating humidity shall be within the range of 20 % to 80 % (non-condensing).

6. The camera storage humidity shall be within the range of 20 % to 95 % (non-condensing).

7. The camera dimensions (Dia. x H) shall be approximately:
   4 1/4 in. x 2 in. (106 mm x 50.5 mm).

8. The camera shall weigh approximately 5.6 oz. (160 g) (not including cables).

9. The camera shall be designed to be mounted directly on a ceiling or wall with 2 screws (not supplied).

10. The camera shall have the following body color selections: Black or White.

J. REGULATORY SPECIFICATIONS:

1. UL2044, FCC 15B Class B, IC Class B
2. IEC60950-1
3. VCCI Class B
4. Emission: EN55022(A) + EN55024 + EN50 130-4
5. C-Tick Class B

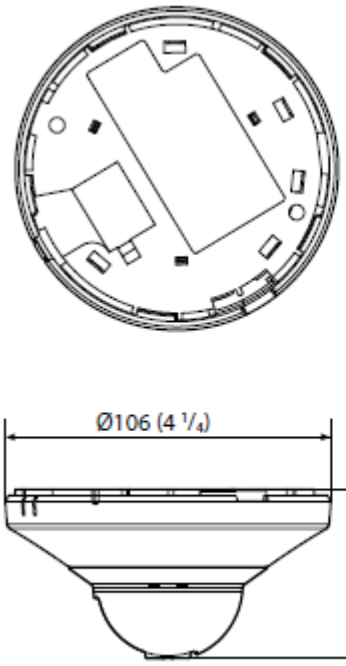
K. SUPPLIED ACCESSORIES:

1. CD-ROM (User's Guide, SNC toolbox, RealShot Manager Lite) (1)
2. Installation Manual (1)
3. Sensor input cable (1)
4. Template (1)
5. Warranty booklet (1)

L. OPTIONAL ACCESSORIES:

1. 3-855-973-02 Fall-prevention rope

M. DIMENSIONS:



Units: mm (inches)

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