

(Project No.)  
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## **ARCHITECT & ENGINEER SPECIFICATIONS**

### **SECTION 28 23 29 VIDEO SURVEILLANCE REMOTE DEVICES AND SENSORS**

#### **SNC-DM160 Vandal Resistant, Day/Night, Megapixel Minidome Network Color Camera**

## **PART 2 – PRODUCTS**

### **2.01 NETWORK CAMERA SPECIFICATIONS**

#### **A. GENERAL REQUIREMENTS:**

1. The SNC-DM160 shall be a network enabled, JPEG and MPEG-4 dual-stream, vandal resistant, day/night, megapixel minidome color camera, utilizing a 1/3-type, 1296 x 966 pixels, Progressive Scan CCD with ExwavePRO™ technology, which adopts a complementary color filter.
2. The SNC-DM160 shall have an analog video output producing 600 TV lines of horizontal resolution.
3. Network interface shall be via an 8-pin RJ-45 connector, 10Base-T /100Base-TX Ethernet.
4. The SNC-DM160 shall utilize JPEG and MPEG-4 compression. The maximum resolution for JPEG shall be 1280 x 960 (Quad VGA) and the maximum resolution for MPEG-4 shall be 640 x 480 (VGA). JPEG Compression levels shall be user selectable in 10 levels of compression ratios, based on an image of 24bits per picture element (8bits each for YUV).
5. The SNC-DM160 shall incorporate a built-in web server, such that the standard web browser Microsoft® Internet Explorer (version 6.0 or higher recommended) can be used to view the camera view without need for special viewer software. The supported operating systems shall be Windows Vista® and Windows® XP. Minimum PC requirements shall be the Intel® Pentium® 4 Processor, 3 GHz or higher, or the Intel Core®2 Duo Processor, 2 GHz or higher, with 1GB RAM or more supporting 1600 x 1200 resolution, 24-bit True Color display capability with Ethernet 100Base-TX.
6. The SNC-DM160 shall be capable of supporting up to 10 users simultaneously over the network.

7. The SNC-DM160 shall be capable of combining two pixels horizontally and vertically, or so called the 'Light Funnel' function, by schedule, in response to surrounding light conditions, or using CGI commands. This shall enable the camera to achieve approximately a fourfold increase in sensitivity at normal shutter speeds, at a maximum resolution of 640 x 480.
8. The SNC-DM160 shall be capable of electronic pan/tilt/zoom, or so called 'Solid PTZ' when resolution is at 640 x 480, with 'Light Funnel' function OFF.
9. The SNC-DM160 shall have up to 6 user level settings. 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	●	●	●	●	●	●
Receive the audio	●	●	●	●	●	●
Control the image view size	●	●	●	●	●	-
Zoom an image using the digital zoom	●	●	●	●	●	-
Save a still image in the computer	●	●	●	●	●	- 1)
Call the Preset position <sup>2)</sup>	●	●	●	●	-	-
Perform the pan/tilt/zoom operation <sup>3)</sup>	●	●	●	-	-	-
Control the frame rate (Available in JPEG mode only)	●	●	-	-	-	-
Send an image file to the FTP server	●	●	-	-	-	-
Send an image attached to an e-mail	●	●	-	-	-	-
Record an image in the memory	●	●	-	-	-	-
Control the alarm output of the I/O port on the camera	●	●	-	-	-	-
Switch the Day/Night function mode	●	●	-	-	-	-
Play an audio file (Voice alert)	●	●	-	-	-	-
Control the setting menu	●	-	-	-	-	-

● Usable -Not usable

1) This function is usable with the Java applet viewer.

2) Available only when SolidPTZ is enabled.

10. Maximum frame rate capability of the SNC-DM160 over LAN shall be up to 15 frames per second at 1280 x 960 (Quad VGA), 960 x 720, 768 x 576, and 640 x 480 resolutions and when the 'Light Funnel' function is ON, up to 30 frames per second at 640 X 480 (VGA) resolution when JPEG compression is selected. Maximum frame rate shall be 30 frames per second at 640 x 480 (VGA) resolution ('Light Funnel' function ON) and 15 frames per second ('Light Funnel' function OFF), when MPEG-4 compression is selected.
11. The SNC-DM160 shall have the capability of simultaneously streaming JPEG and MPEG-4 compressed video, as well as the capability to independently stream either JPEG or MPEG-4 compressed video.
12. The SNC-DM160 shall have a quick focus function, whereby the auto iris lens shall fully open to allow the installer to focus on specific areas

of the image. To prevent over saturation, when the quick focus is activated, the electronic shutter shall automatically engage to high speed mode.

13. Codec, image size, frame rate, and function combinations and limitations are shown in the chart below:

Quality setting: JPEG @ Level 5 (1/30 compression),  
MPEG-4 @ 2,048 kbps

	Menu	Mode	Max fps	Light Funnel	JPEG					MPEG 4							
					Image size	Crop-ping	Solid PTZ	Super-impose	Zone masking	Image size	Solid PTZ	Super-impose	Zone masking				
Codec & Image Size Combination (Selectable from Pull Down Menu on Setup GUI)	1	Single Codec (JPEG only)	15fps	N/A	1280 x 960	Yes	No	No	Yes	OFF							
	6				960 x 720	No	Yes	Yes	Yes								
	7				768 x 576												
	2	Dual Codec		OFF	1280 x 960	No	No	Yes	Yes	Yes Yes Yes							
	3				640 x 480		No	No	No								
	4			384 x 288										Yes	Yes	Yes	
	5																320 x 240
	8			640 x 480	Yes		Yes	Yes									
	9			384 x 288													
	10			320 x 240													
Light Funnel ON	2	Single Codec	30fps	ON	640 x 480	No	No	Yes	Yes	OFF							
	3	Dual Codec								640 x 480	No	Yes	Yes	No Yes Yes			
	4													384 x 288	Yes	Yes	Yes
	5																
Hybrid Operation	Analog + IP	15fps	OFF	1280 x 960	No	No	No	No	OFF								
		30fps	ON	640 x 480					640 x 480 No No No								
Installation	Iris Open ON	15fps	OFF	1280 x 960	OFF												

14. Constant bit rate algorithm for JPEG files:

The SNC-DM160 shall be capable of equalizing JPEG file sizes to have stable bandwidth utilization. File size for each compression level is as follows:

Level	Data Size @ Quad VGA (1290 x 960) (approx.)	Data Size @ VGA (640 x 480) (approx.)	Compression Ratio (approx.)
10	600 KB	150 KB	1/6
9	360 KB	90 KB	1/10
8	240 KB	60 KB	1/15
7	180 KB	45 KB	1/20
6	144 KB	36 KB	1/25
5	120 KB	30 KB	1/30
4	102.8 KB	25.7 KB	1/35
3	90 KB	22.5 KB	1/40
2	72 KB	18 KB	1/50
1	60 KB	15 KB	1/60

15. The SNC-DM160 shall have the capability to stream MPEG-4 video in TCP or UDP protocol.
16. The SNC-DM160 shall have an Adaptive Rate Control (ARC) function when using MPEG-4 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.
17. SNC-DM160 shall incorporate a built-in motion detection capability.
18. To minimize false triggers, the SNC-DM160 Intelligent Motion Detection (IMD) shall compare the current image with prior 15 frames within the camera. The IMD algorithm shall allow the camera to discriminate against some environmental noise such as shaking leaves or AGC noise.
19. The SNC-DM160 shall be capable of image cropping in JPEG mode, such that only the area of interest is transmitted, to reduce bandwidth and file storage requirements.
20. The SNC-DM160 shall be capable of combining IMD with the Solid PTZ function to transmit a cropped VGA sized image of the area where motion is detected. The camera shall be able to track the detected object within the megapixel field of view.
21. The SNC-DM160 shall support the following Network protocols: TCP/IP, DNS, RTP/RTCP, UDP, ARP, HTTP, ICMP, SMTP, FTP, DHCP, NTP and SNMP (MIB2). Network security shall be via Password (basic authentication) and IP filtering.
22. The SNC-DM160 shall have both FTP client and server capabilities.
23. The SNC-DM160 shall have user configurable port settings.
24. The SNC-DM160 shall be capable of dynamic IP address change notification. It shall accomplish this via an email to a specified address when its IP address changes.
25. The SNC- DM160 shall have an integral 3.6x (2.8 to 10.0 mm) F1.3 – F3.0, IR compensated DC auto-iris type vari-focal lens.
26. The SNC-DM160 shall be Power over Ethernet capable, compliant to the 802.3af standard.
27. The SNC-DM160 shall incorporate a built-in heater with a thermostat that activates the heater when ambient conditions drop to extremely

low temperatures. The camera shall support the 802.3af (PoE) inclusive of the heater.

28. The SNC-DM160 shall have privacy zone masking which blocks out unwanted or prohibited area within the video image to protect privacy. Mask colors shall be Black, White, Gray, Red, Green, Blue, Cyan, Yellow, and Magenta. The camera shall be capable of masking up to seven (7) areas. Such capability shall be via vendor supplied utility software.
29. The SNC Privacy Masking Tool software shall be supplied with the camera as a standard accessory in the CD-ROM.
30. The SNC-DM160 shall have the capability for Camera ID as well as Date/Time data to be superimposed on the video image. Camera ID shall be up to 20 alphanumeric characters. Camera ID cannot be superimposed when resolution is set to 1280 x 960, JPEG compression with image cropping on. Date/Time format shall be yyyy-mm-dd hh:mm:ss, mm-dd-yyyy hh:mm:ss, and dd-mm-yyyy hh:mm:ss, user selectable, and use shall have option to move the position to the four (4) corners of the video image. IMD shall not be effective in the selected superimposed areas.
31. The minimum electronic shutter setting shall be 1 second, and a maximum of 1/10,000 sec.
32. The SNC-DM160 shall have a 6-pin I/O interface located on the rear of the base. There shall be an alarm input port, and 2 Alarm/relay output ports. The Alarm input port shall be opto-isolated.
33. The SNC-DM160 shall support IP Filtering, whereby access to the camera can be restricted to one or more groups of selected users. Up to ten different groups can be established by defining an IP address range for each group.
34. The SNC-DM160 access shall be capable of Password Protection. User names and passwords shall be assignable to allow 6 levels of access.
35. The administrator shall have complete access/control of the cameras.
36. The other five levels of access can be set to limit user privileges to functions such as viewing, changing image size, etc.
37. The SNC-DM160 shall be capable limiting the bandwidth from 64 kbps to 2048 kbps in MPEG-4 and 500 kbps to 4 mbps in JPEG.

38. The SNC-DM160 shall have an internal image memory size of 8MB for alarm buffering.

39. The SNC-DM160 shall support multi-casting in MPEG-4 mode and shall use UDP protocol.

40. The SNC-DM160 shall be capable of pre- and post- alarm buffering.

41. The SNC-DM160 Pre/post-alarm recording capabilities shall be as follows:

- i. Capable of storing several seconds of pre-alarm and post-alarm images when an alarm is triggered by the motion detection or sensor input.
- ii. Capable of recording image and sound files on the 8 MB of built-in memory or transferring the files to an FTP server.
- iii. Record in the codec format selected for monitoring.
- iv. Have a maximum duration for pre- and post-alarm recording that shall be dependent on the bit rate setting (for MPEG-4) or the picture quality and frame rate setting (for JPEG) as shown in the following tables:

**MPEG-4**

bitrate[kbps]	2048	1536	1024	768	512	384	256	128	64
capacity[sec]	19	25	38	51	76	102	120	120	120

**JPEG 1280 x 960**

Quality	10	9	8	7	6	5	4	3	2	1
Frame rate	15	1	1	2	2	2	3	4	4	4
	10	1	1	2	2	3	4	4	6	7
	8	1	1	2	3	4	5	6	7	8
	6	1	2	3	4	6	7	9	10	11
	5	1	2	4	6	7	9	10	12	14
	4	1	3	5	7	9	11	13	15	17
	3	2	4	7	10	12	15	18	21	23
	2	3	7	11	15	19	23	27	31	35
1	7	15	23	31	39	47	55	63	71	

**JPEG 960 x 720**

Quality		10	9	8	7	6	5	4	3	2	1
Frame rate	15	1	1	2	3	4	5	6	7	8	9
	10	1	2	4	5	7	8	9	11	12	14
	8	1	3	4	7	8	10	11	14	15	17
	6	2	4	7	9	11	14	16	18	21	23
	5	2	5	8	11	14	16	19	22	25	28
	4	3	7	10	14	17	21	24	28	31	35
	3	4	9	14	18	23	28	32	37	42	46
	2	7	14	21	28	35	42	49	56	63	70
1	14	28	42	56	70	84	98	112	120	120	

**JPEG 768 x 576**

Quality		10	9	8	7	6	5	4	3	2	1
Frame rate	15	1	2	4	5	7	8	9	11	12	14
	10	2	4	6	8	10	12	15	17	19	21
	8	2	4	7	10	13	16	18	21	24	27
	6	3	7	10	14	18	21	25	29	32	36
	5	4	8	12	17	21	25	30	35	39	44
	4	4	10	16	21	27	32	38	44	49	55
	3	7	14	21	29	36	44	51	58	65	73
	2	10	21	32	44	55	65	77	88	99	110
1	21	44	65	88	110	120	120	120	120	120	

**JPEG 640 x 480**

Quality		10	9	8	7	6	5	4	3	2	1
Frame rate	30	1	2	2	4	4	6	7	8	9	10
	25	1	2	3	4	6	7	8	9	11	12
	20	1	2	4	6	7	9	10	12	14	15
	15	2	4	6	8	10	12	14	16	18	21
	10	2	6	9	12	15	18	21	25	28	31
	8	3	7	11	15	19	23	27	31	35	39
	6	4	10	15	21	25	31	37	42	47	52
	5	6	12	18	25	31	37	44	50	56	63
	4	7	15	23	31	39	47	55	63	71	79
	3	10	21	31	42	52	63	74	84	95	105
	2	15	31	47	63	79	95	111	120	120	120
1	31	63	95	120	120	120	120	120	120	120	

**JPEG 384 x 288**

Quality	10	9	8	7	6	5	4	3	2	1	
Frame rate	30	2	5	8	11	14	17	20	23	25	29
	25	3	7	10	14	17	21	24	28	31	35
	20	4	8	12	17	21	25	30	35	39	44
	15	5	11	17	23	29	35	40	46	52	58
	10	8	17	25	35	44	52	61	70	79	88
	8	10	21	32	44	55	65	77	88	99	110
	6	14	29	44	58	73	88	102	117	120	120
	5	17	35	52	70	88	105	120	120	120	120
	4	21	44	65	88	110	120	120	120	120	120
	3	29	58	88	117	120	120	120	120	120	120
	2	44	88	120	120	120	120	120	120	120	120
1	88	120	120	120	120	120	120	120	120	120	

**JPEG 320 x 240**

Quality	10	9	8	7	6	5	4	3	2	1	
Frame rate	30	4	8	12	16	21	25	29	33	37	42
	25	4	9	14	20	25	30	35	40	45	50
	20	6	12	18	25	31	37	44	50	56	63
	15	8	16	25	33	42	50	58	67	76	84
	10	12	25	37	50	63	76	88	101	114	120
	8	15	31	47	63	79	95	111	120	120	120
	6	21	42	63	84	105	120	120	120	120	120
	5	25	50	76	101	120	120	120	120	120	120
	4	31	63	95	120	120	120	120	120	120	120
	3	42	84	120	120	120	120	120	120	120	120
	2	63	120	120	120	120	120	120	120	120	120
1	120	120	120	120	120	120	120	120	120	120	

42. The SNC-DM160 shall support IEEE-802.1X authentication, and shall:
- i. comply with the IEEE-802.1X standards,
  - ii. be capable of being integrated into an IEEE.802.1X network to achieve high network security,
  - iii. support EAP-TLS mode to use a key pair from a Certificate Authority (CA).

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

**B. CAMERA LENS SPECIFICATIONS**

1. The SNC-DM160 shall have an integrated 3.6x vari-focal lens.

2. Focal length shall be 2.8 – 10.0 mm with a field of view coverage of 100.8° – 27°
3. The integral lens shall be an IR compensated type lens.
4. The aperture range for the lens shall be F1.3 to F3.0.

#### C. VIDEO-ELECTRICAL REQUIREMENTS

1. The SNC-DM160 input power shall be a power voltage of either AC 24V or DC 12V, and shall be Power over Ethernet (PoE) 802.3af standard compliant.
2. The SNC-DM160 shall incorporate a built-in heater. The camera shall support the 802.3af (PoE) inclusive of the heater.
3. The power connection shall be by means screw down mini terminal connectors for AC 24V and DC 12V operation.
4. The SNC-DM160 shall have composite analog video output in addition to streaming video via Ethernet.
5. The video output of the SNC-DM160 shall be selectable from either the NTSC or PAL standards.
6. Horizontal resolution shall be 600 TV lines.
7. The SNC-DM160 color mini dome camera shall require a minimum scene illumination of: 0.8 lx at F1.3 (50 IRE, AGC ON 30dB) in color and 0.15 lx at F1.3 (50 IRE, AGC ON 30dB) in B/W at 1280 x 960 resolution.
8. The SNC-DM160 shall be capable of combining two pixels horizontally and vertically, or so called the 'Light Funnel' function, which shall enable the camera to achieve approximately a fourfold increase in sensitivity at normal shutter speeds. When the 'Light Funnel' function is ON, the camera shall require a minimum scene illumination of: 0.2 lx at F1.3 (50 IRE, AGC ON 36dB) in color and 0.03 lx at F1.3 (50 IRE, AGC ON 36dB) in B/W at 640 x 480 resolution.
9. The SNC-DM160 maximum resolution when the 'Light Funnel' function is ON shall be 640 x 480.
10. Camera synchronization shall be Internal.

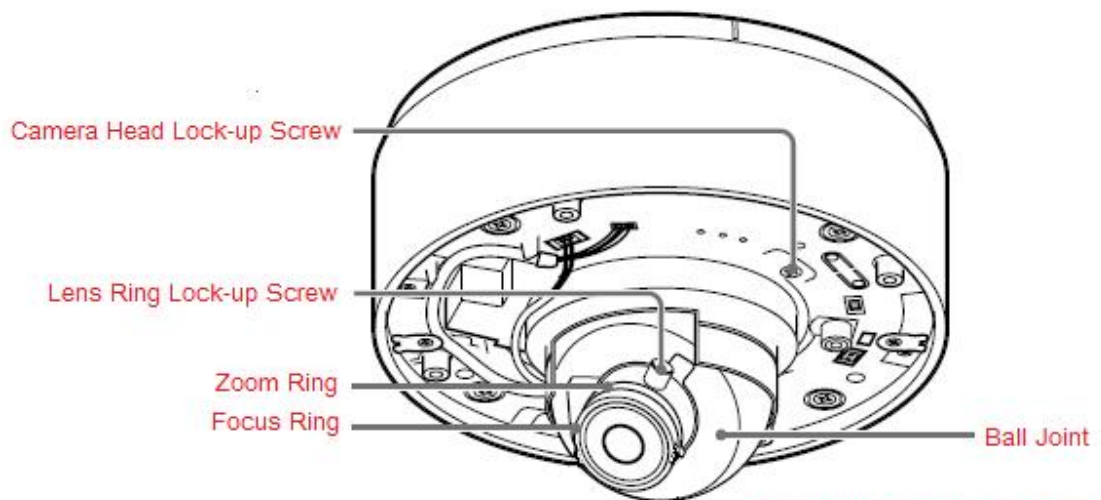
11. The SNC-DM160 shall have an ON/OFF selectable AGC up to 36dB, through the settings menu.
12. The composite video output shall be 1.0 V peak to peak @ 75 ohms.
13. The video signal to noise ratio shall be more than 50dB (AGC OFF, Weight ON).
14. The Auto Tracing White Balance (ATW) balance range shall be approximately 2,000 degrees to 10,000 degrees Kelvin and approximately 3,000 to 7,500 degrees Kelvin for ATW PRO.
15. Power consumption for the SNC-DM160 shall be 12.9 watts maximum.

#### D. AUDIO REQUIREMENTS

1. The SNC-DM160 shall support bi-directional audio, using G.711 (64kbps) and G.726 (40, 32, 24, 16 kbps) codecs.
2. The SNC-DM160 shall have a pigtail cable with mini-jack connectors to support external microphone and active speakers. Mic/line input shall be switchable. Mic input shall be monaural, 2.2 kilo ohms, 2.5V DC plug-in power, line input shall be monaural, and active speaker output shall have a maximum output level of 1 Vrms.
3. The SNC-DM160 shall be capable of storing up to three audio files. Audio files shall be generated and transferred to the camera using the manufacturer provided SNC Upload Tool Software.
4. The SNC-DM160 shall support Voice alert function, which can automatically play an audio file stored on the camera by an alarm trigger using motion detection or via a sensor input
5. The SNC-DM160 shall provide time stamp on the streaming audio. Time stamp shall be inserted in the header area of the audio data.
6. Audio data shall be interleaved with video and serially transmitted in a single session for synchronization.
7. User shall have the capability to activate the microphone input via the web interface

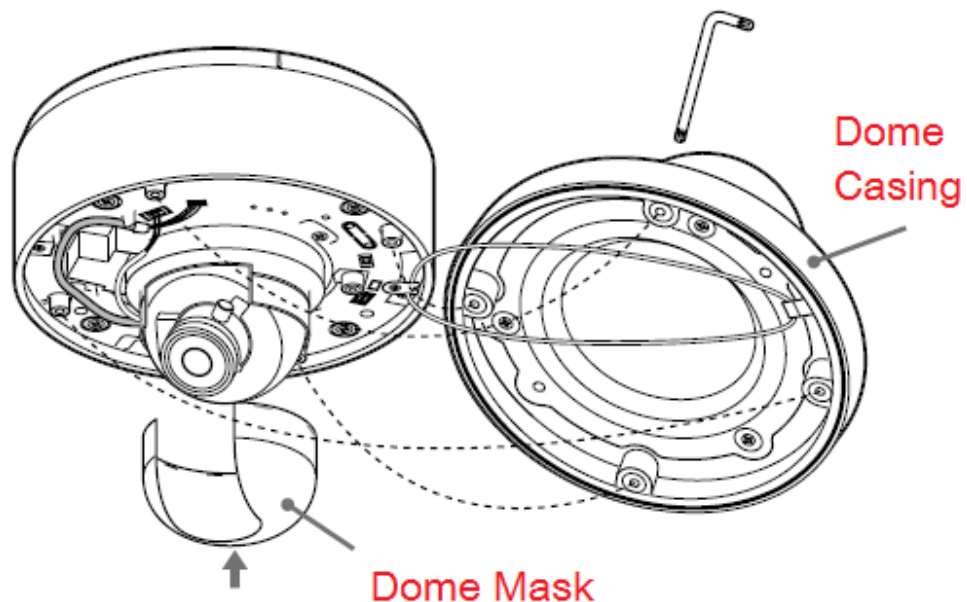
## E. MECHANICAL REQUIREMENTS

1. The SNC-DM160 lens/CCD combination shall be a ball-joint type for easy pan, tilt and rotation adjustments, without need for special tools. This ball joint mechanism shall be capable of being locked in place with the lock screw on the base of the ball joint mechanism. The rotation and pan ranges shall be +/-180 degrees and the tilt range shall be 0 to 72 degrees.



2. The SNC-DM160 camera lens shall be an integrated f2.8 to 10.0 mm F1.3 to F3.0 auto iris vari-focal, IR compensated lens.
3. Input/Output Alarm or sensor input and outputs, shall be via a pigtail cable.
4. The camera shall support one optically isolated Alarm or sensor input, and two relay outputs.
5. The SNC-DM160 shall provide Sensor in/Alarm out ports for interfacing with external equipment. Sensor input shall be configurable for either Normally Open or Normally closed configuration.
6. Relay outputs shall be rated at 24V AC/24V DC, 1 Amp or less.
7. Video output connector from the SNC-DM160 shall be a two (2) pin connector to a pigtail BNC type connector.
8. A secondary analog monitor output shall be provided, accessible from the front after the SNC-DM160 is installed. Interface shall be phono-type connector.

9. The SNC-DM160 dimensions shall be approximately 6 5/8 inches (Dia.) x 4 3/4 inches (H), 166 mm (Dia.) x 119 mm (H) .
10. The SNC-DM160 shall weigh approximately 3 lb 1 oz (1.4 kg).
11. The angle of the CCD/lens assembly shall be secured via a locking screw.
12. For safety, the removable front dome cover shall be secured via a rubber-based material secured through a strap to the main camera body.
13. The SNC-DM160 shall come with a dome mask with aperture slit, such that only the lens viewing area is exposed via the lower clear dome cover, which can be rotated to accommodate the lens orientation.



14. Network interface shall be via RJ-45 located inside the base of the camera. A pre-installed RJ-45 pigtail shall be provided.
15. The SNC-DM160 shall be capable of being flush mounted to a ceiling using an optional Flush mount kit YT-ICB45/1, available from the camera manufacturer.
16. The SNC-DM160 shall have a 3/4" conduit to help prevent water ingress around the cabling.

## F. ENVIRONMENTAL REQUIREMENTS

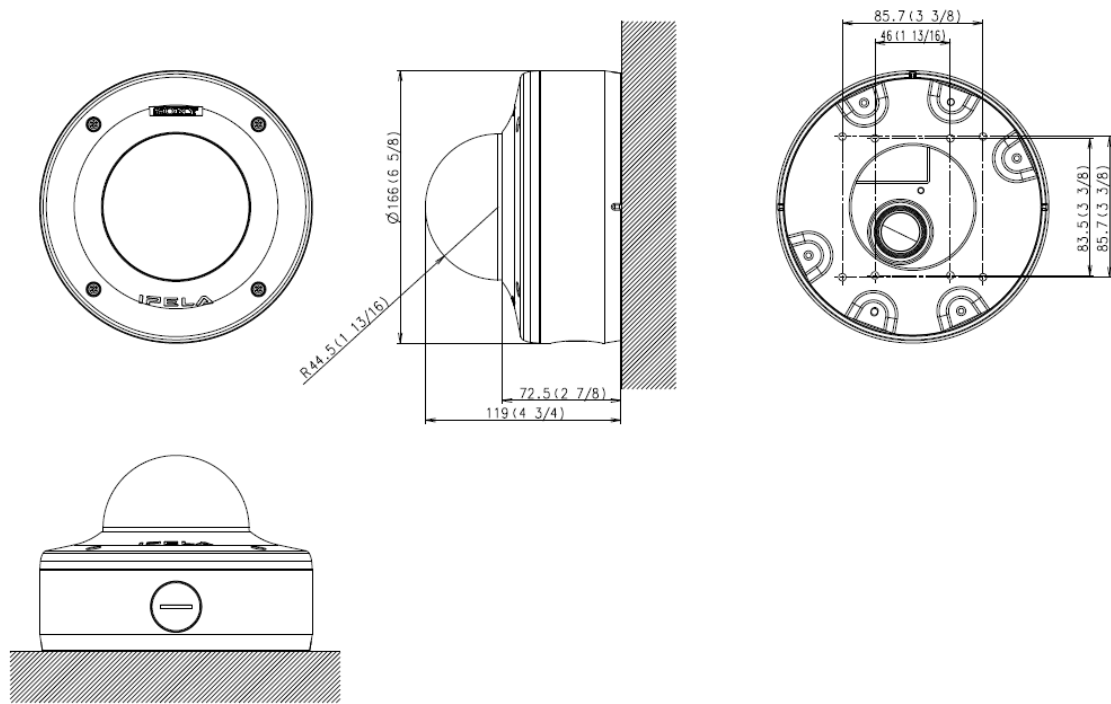
1. The operating temperature shall be within the range -22°F to 122°F (-30°C to +50°C).
2. Storage temperature shall be within the range -4°F to 140°F (-20°C to +60°C).
3. The SNC-DM160 shall have a built-in heater unit allowing the camera to operate in extremely cold environments as low as -22°F (30°C). Cold start temperature of the camera shall be 32°F (0°C).

#### G. SUPPLIED ACCESSORIES

1. CD-ROM (User's guide, IP setup program, Audio Upload Tool, Privacy Masking Tool, Video Player, Custom Homepage Installer)
2. Installation manual
3. Bracket
4. Template
5. Torx wrench
6. M4 screws (4)
7. Wire rope
8. M4 shoulder screw
9. Sensor I/O pigtail cable
10. Mic IN/Audio Out pigtail cable with mini-jack connectors
11. LAN cable
12. BNC cable
13. Power input cable

#### Dimensions

SNC-DM160
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Units: mm (inches)

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