IPC4500
Hardware Manual

(IPC4500A-25D, IPC4500A-23
IPC4501A-25D, IPC4501A-23)

UDP Technology

Table of Contents

1. INTRODUCTION

This IPC4500 compress video/audio data and transmit the compressed video/audio data through the network in real time. IPC4500 provides a high quality video image with a limited bandwidth and storage capacity. These products are ideally suited for a wide range of surveillance and remote monitoring applications. Main features are highlighted below.

Main features

- High Quality Compression in real time streaming
- NVE provides high quality MPEG-4 and MJPEG encoding at D1 in real time. Main features

Network

- RTP/RTSP and unicast/multicast are supported.

Streaming

- IPC4500 supports de-interlacing by hardware.

Video/Audio

- Loop out is supported
- IPC4500 supports two ways audio
  Transmits to client - G.711 by software
  Receives from client - one digital audio

Camera

- 25X Auto Focus Optical Zoom Lens, 10X Digital Zoom (Total 250X Zoom Ratio)
- Vandal Proof Housing (IP 66 Rating)
- Day / Night with removable IR Cut Filter (Auto ICR)
- DSS (Digital Slow Shutter) : (IPC4500A-25D, IPC4500A-25D only)
- Minimized Vibration at slow speed
- Auto Flip 180 Dome Rotation
- Turbo speed is maximum 430 per seconds

Additional Features

- Motion detection by hardware.
- On Screen Display (OSD) by hardware.
- RS-485 serial port
- RS-232C serial port for some devices like a POS terminal.
- IPC4500 supports built-in surge protection and lightning protection circuit.

SDK

- Four types (RTSP, UDA5, ActiveX, HTTP-API) are provided for application development.

2. Product Description

2.1. Specifications

IPC4500 specification is shown as following Table

Network

		IPC4500A-25D,IPC4500A-23,IPC4501A-25D,IPC4501A-23
Video	Compression	MPEG-4, JPEG
	Resolution	D1, 2CIF, CIF, QCIF
	Compression FPS	25/30 fps @ D1
Audio	Input/Output	1 / 1 ch
	Compression	PCM(software compression : G.711, uLaw)
Network		10/100 Base-T
RS-232C		Supported
RS-485 / 422		Supported
De-interlacing		Supported by hardware
Motion Detection		Supported by hardware
OSD & Private Region Masking		Supported by hardware
Video Stream Encryption		AES
Protocol		TCP,UDP,DHCP,HTTP,NTP,RTSP,RTP(Unicast,Multicast)

Camera

	IPC4500A-25D, IPC4501A-25D	IPC4500A-23, IPC4501A-23
Pick Up Device	Sony ¼" Super HAD CCD	
Effective Pixels	NTSC – 768(H) x 494 (V) / PAL – 752 (H) x 582(V)	
Television System	2 : 1 Interlace	
Horizontal Resolution	NTSC – 470 TVL / PAL – 460 TVL	
Minimum Illumination	1.0 Lux (30 IRE) Day / Night Off (Color)	1.0 Lux (30 IRE)
	0.1 Lux (30 IRE) Day / Night On (B & W)	
	0.01 Lux Slow Shutter x 128 On	
	0.001 Lux (30 IRE) Day / Night On (B & W) + DSS	
Lens	25X Optical Day / Night	23 X Optical
	F 1.6 f=3.8 ~ 95 mm	F1.6 f=3 .8 ~ 87.4 mm
S/N Ratio	50 dB	49 dB

Dome

	IPC4500A-25D, IPC4500A-23	IPC4501A-25D, IPC4501A-23
	360º Continuous (High Speed Dome)	0º ~ 355º Limited (PTZ)
Pan Angle / Speed	360º Continuous Rotation, 0.1 ~90 º / Sec Turbo Speed : 430 / Sec	0º ~ 355º, 0.1º ~ 90º / Sec
Preset Speed	360º / 430º /500º Selectable, Default 360º / Sec	Max. 180º / Sec
Tilt Angle / Speed	0 ~ 94, 0.1 ~90 / sec (According to Zoom Ratio)	
Camera ID	999	
Home	Default / Preset / Tour /Auto Scan /Patter Programmable	
Preset	319 Position (16 Characters Input)	160 Position (16 Characters Input)
Auto Scan	8 Auto Scan	4 Auto Scan
Guard Tour	8 Guard Tour (Preset, Pattern, Auto Scan, Tour Input)	4 Guard Tour (Preset, Pattern, Auto Scan, Tour Input)
Pattern	4 Pattern (240 Sec Memory)	2 Pattern (240 Sec Memory)
Remote Control	Network / RS-485, 422	
Alarm Input	2 Inputs (NC/NO)	
Alarm Output	1 Relay 24 VAC / 1 A (NC/NO)	
Global Key	Available	
Self Monitoring Software	Built-in	
On Screen Display	Camera ID, Pan / Tilt Angle, Flip, Zoom etc,	
Material	Diecasting/Uletan Polycarbonate Vandal	
Color	Ivory	
Dimensions	Φ273.8 x 296.5(D) mm	
Weight	4,580 g	

3. INSTALLATION & CONFIGURATION

3.1. Package Contents

The Package contains the following

IPC4500 ---------- 1
Ceiling Mount Bracket ---------- 1
Joint Pipe ---------- 1
Plastic Anchor ---------- 4
Screws for Plastic Anchor ---------- 4
L-Wrench (M2) ---------- 1
L-Wrench (M3) ---------- 1
LAN Cable (Cross Type 1.5m) ---------- 1
7 Pin IPC Cable ---------- 1
9 Pin IPC Cable ---------- 1
Silicon Rubber Sealant ---------- 1
Teflon Tape ---------- 1
Terminal Block ---------- 1

3.2. Part List

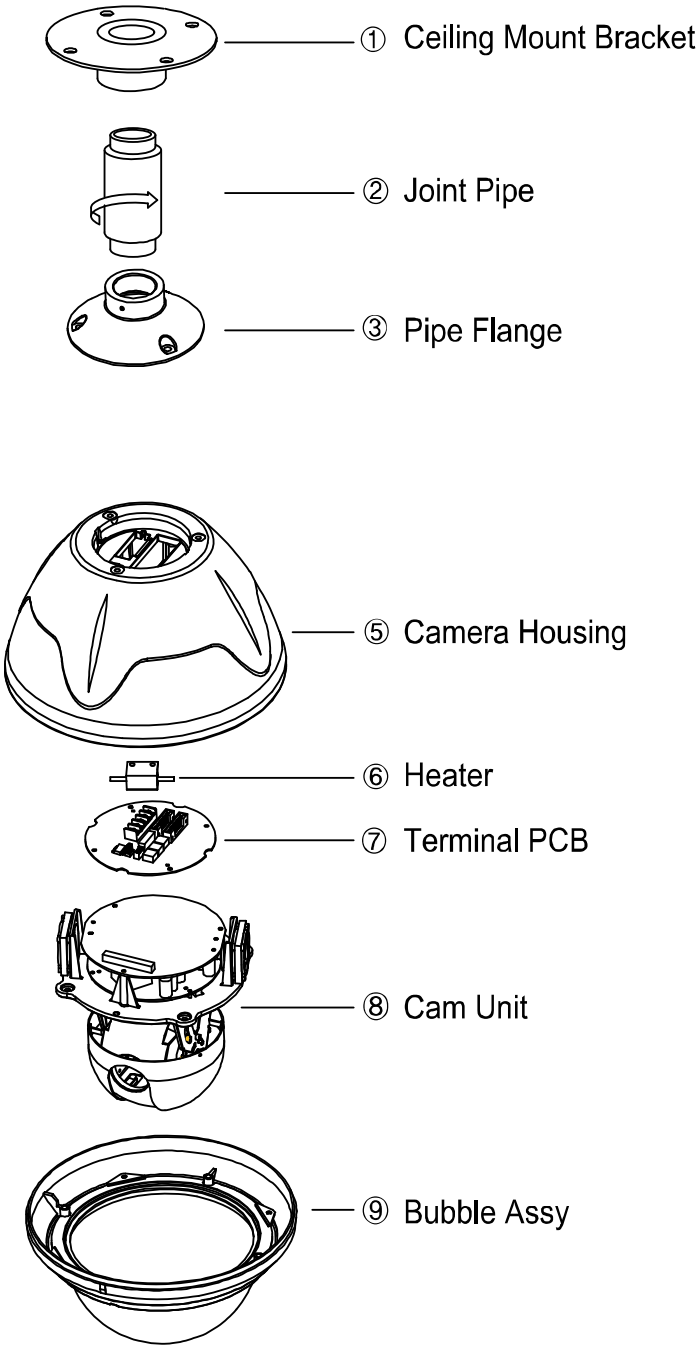


Figure 1. Part List

3.3. Basic Configuration of IPC4500

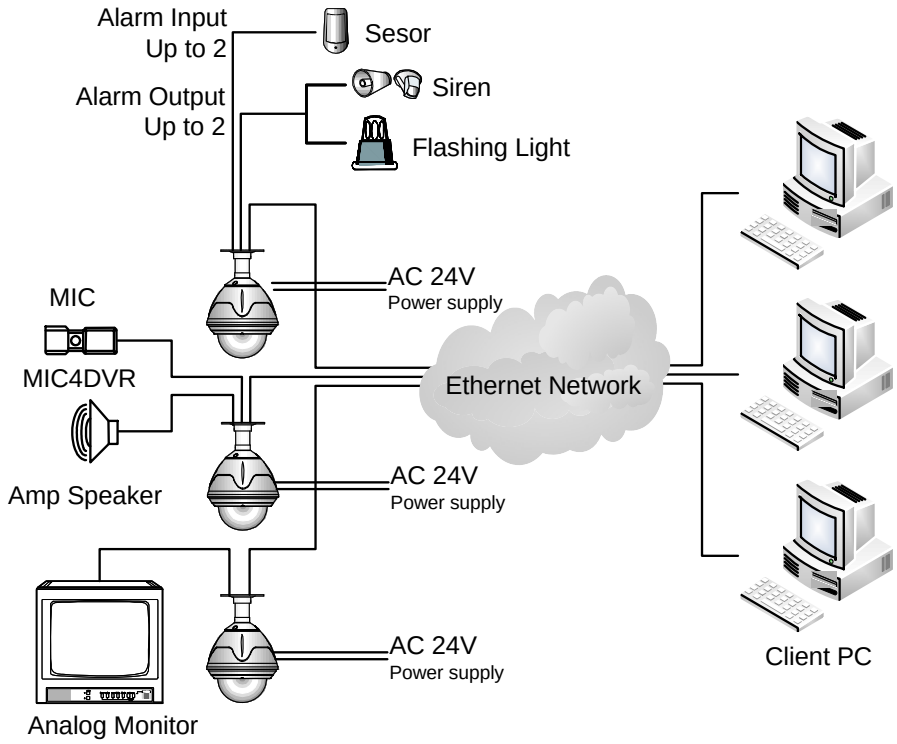


Figure 2. Basic Installation Configuration

The dome camera is for use in surface mounting applications and the mounting surface should be capable of supporting loads up to 14 lb(6Kg)

The dome camera's base should be attached to a structural object, such as a hard wood, wall stud or ceiling rafter that supports the weight of the dome camera.

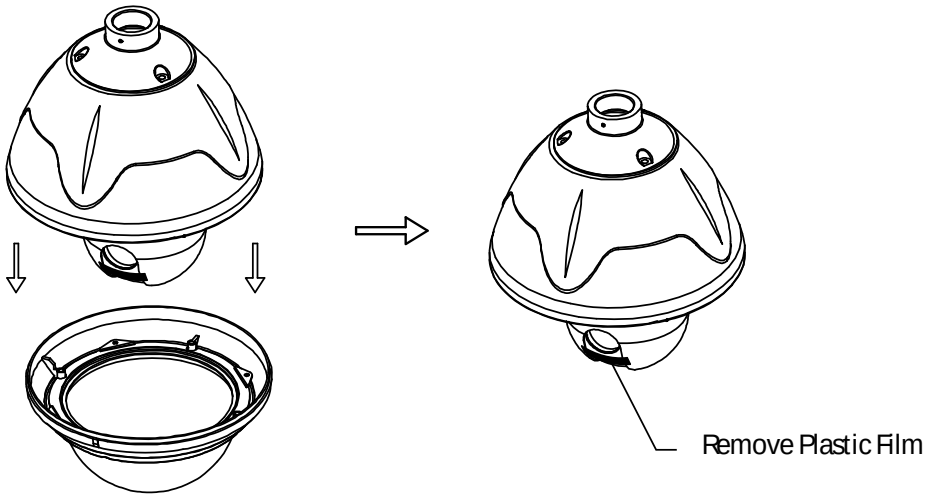


Figure 3. Bubble Assy

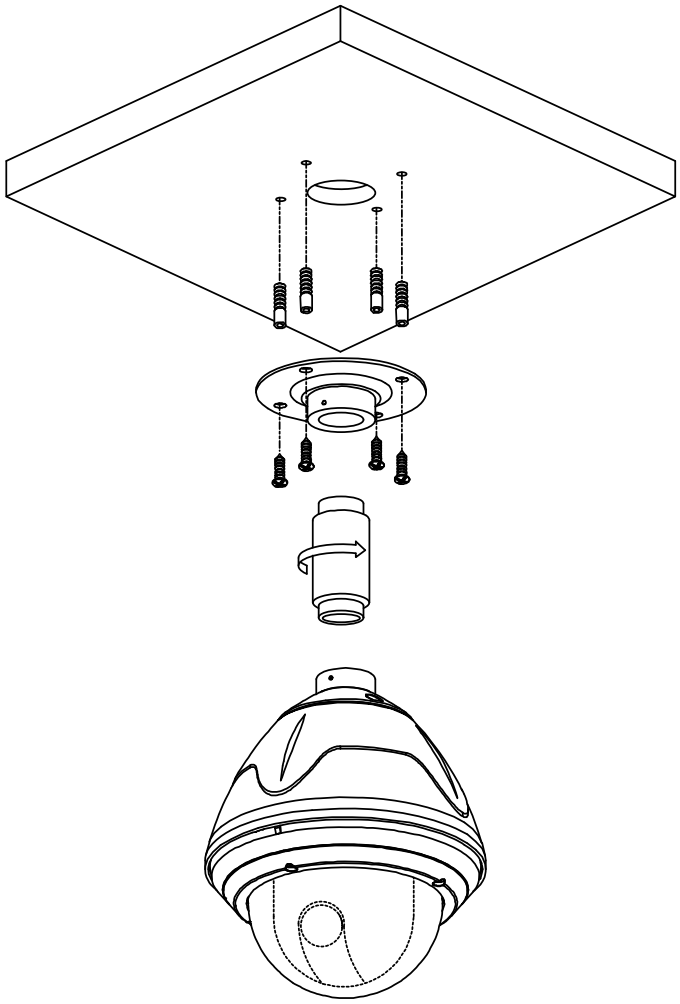


Figure 4. Installation of ceiling mount

The dome camera must be installed by qualified service personnel in accordance with all local and federal electrical and building codes. The system should be installed according to Figures 2 through 10.

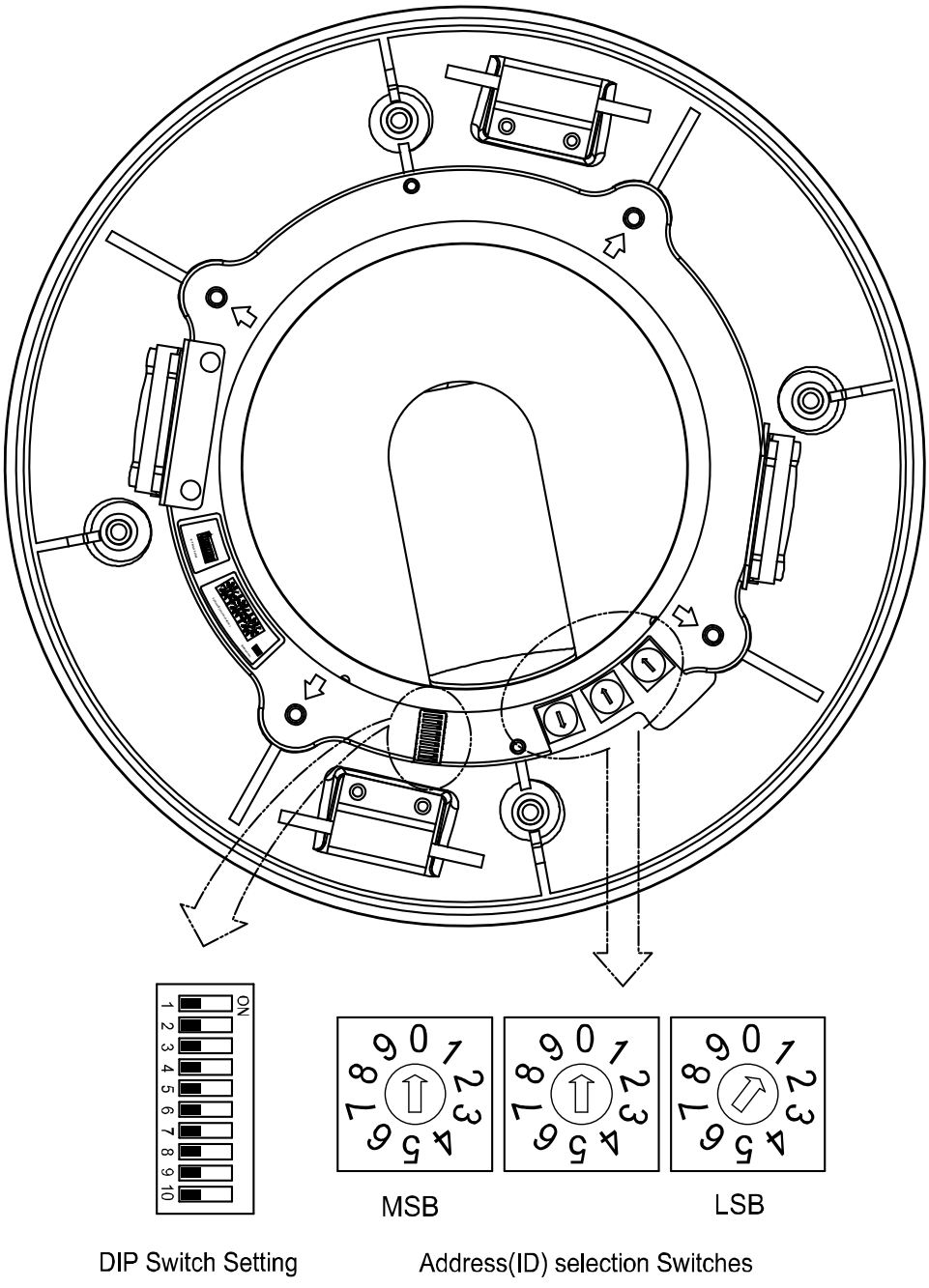


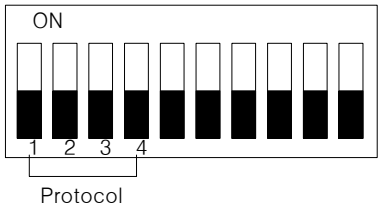
Figure 5. Layout of Switches

3.4. DIP Switch Setting

If a dome camera is to be installed with a Cyber Scan joystick controller or if a dome camera is controlled through the network, select **Cyber Scan II** Protocol and if Consult service

personnel if a dome camera is installed with device other than a joystick.

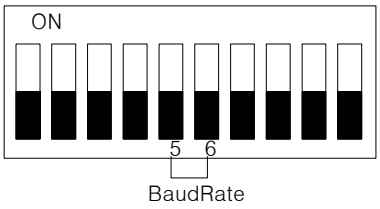
Protocol Setting



* Factory Mode : Cyber Scan II

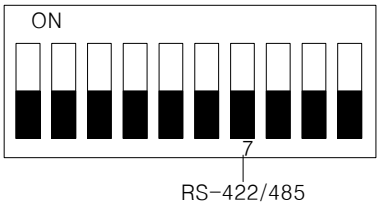
1	2	3	4	PROTOCOL
OFF	OFF	OFF	OFF	Cyber Scan I
OFF	OFF	OFF	ON	P-D Type
OFF	OFF	ON	OFF	P-P Type
OFF	ON	OFF	OFF	G-Speed Dome
ON	OFF	OFF	OFF	SNS Type
OFF	ON	OFF	ON	KAL Type
OFF	ON	ON	OFF	DEN Type
OFF	ON	ON	ON	BOS Type
ON	OFF	OFF	OFF	SAMS Type
ON	OFF	OFF	ON	SAE Type
ON	OFF	ON	OFF	Reserved
ON	OFF	ON	ON	Reserved
ON	ON	OFF	OFF	Reserved
ON	ON	OFF	ON	Reserved
ON	ON	ON	OFF	Reserved
ON	ON	ON	ON	Cyber Scan II

Communication Speed



5	6	BAUD RATE
OFF	OFF	9600
OFF	ON	4800
ON	OFF	2400
ON	ON	38400

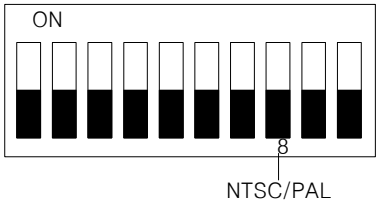
Communication Type



7	FUNCTION
ON	RS-422
OFF	RS-485

* Factory Mode : RS-485

System Type (Factory Use)

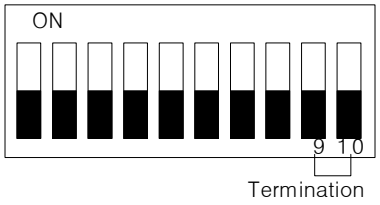


8	FUNCTION
ON	PAL
OFF	NTSC

Figure 6. DIP Switch Setting

Termination Setting

The device which is connected at end of line, whether it be a dome camera or joystick controller, must have the cable for communication terminated by setting the appropriate DIP switch. Without proper termination, there is potential for control signal errors. Total length of the cable for communication should not exceed 1.2Km.



9	10	Function
ON	ON	Termination
OFF	OFF	Not Terminated

* Factory Mode : Not Terminated

Figure 7. Setting Unit for Termination

The dome camera must be installed by qualified service personnel in accordance with all local and federal electrical and building codes. The system should be installed according to Figures 2 through 10.

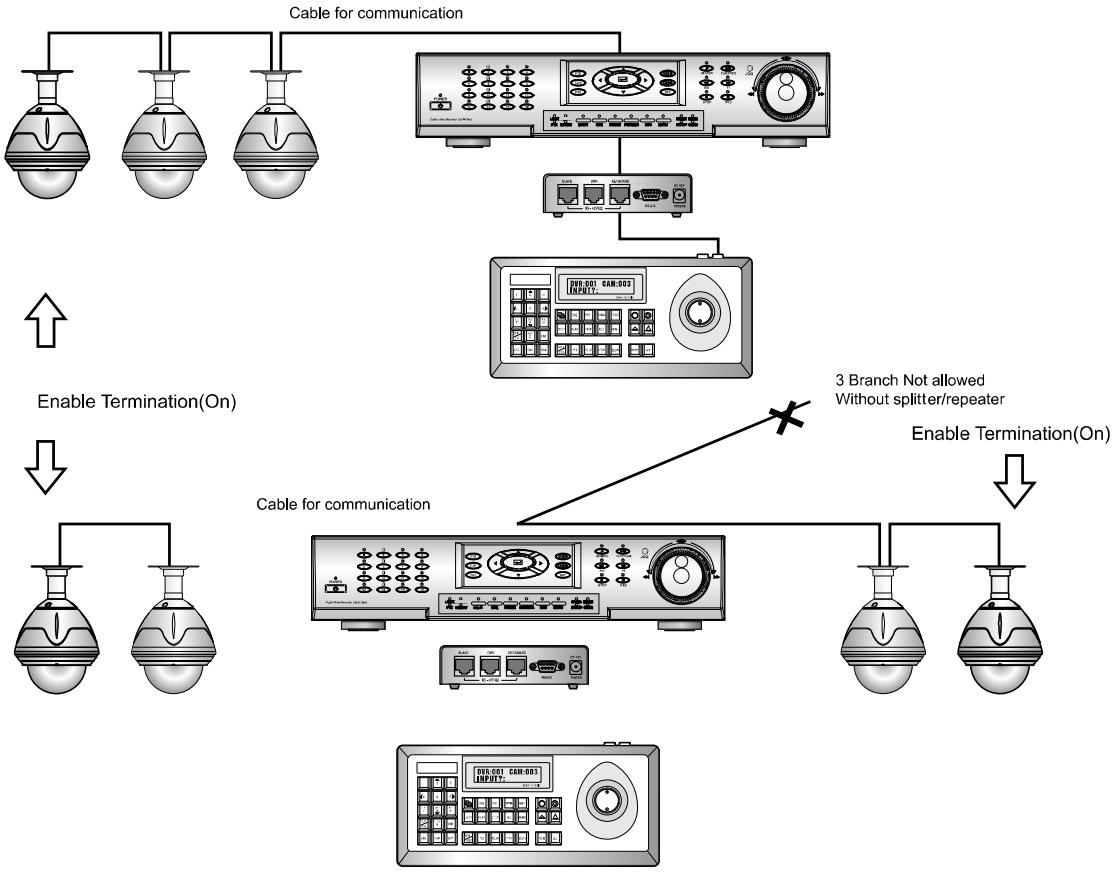
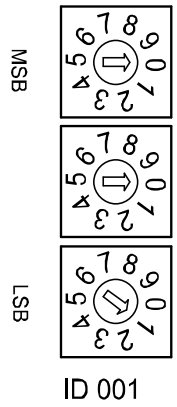


Figure 8. Termination Diagram

3.5. Setting Address(ID) of Dome Camera

To prevent damage, each dome camera must have an unique address(ID). When installing multiple dome cameras using a multiplexer, it is suggested that the dome camera address matches the multiplexer port number.



DOME ID	SW100	SW10	SW1
1	0	0	1
2		0	2
.	.	.	.
999	9	9	9

- SW 100 : MSB(Most Significant Bit)
- SW 1 : LSB(Least Significant Bit)

Figure 9. Setting Address(ID) of Dome Camera

3.6. Connecting Wiring

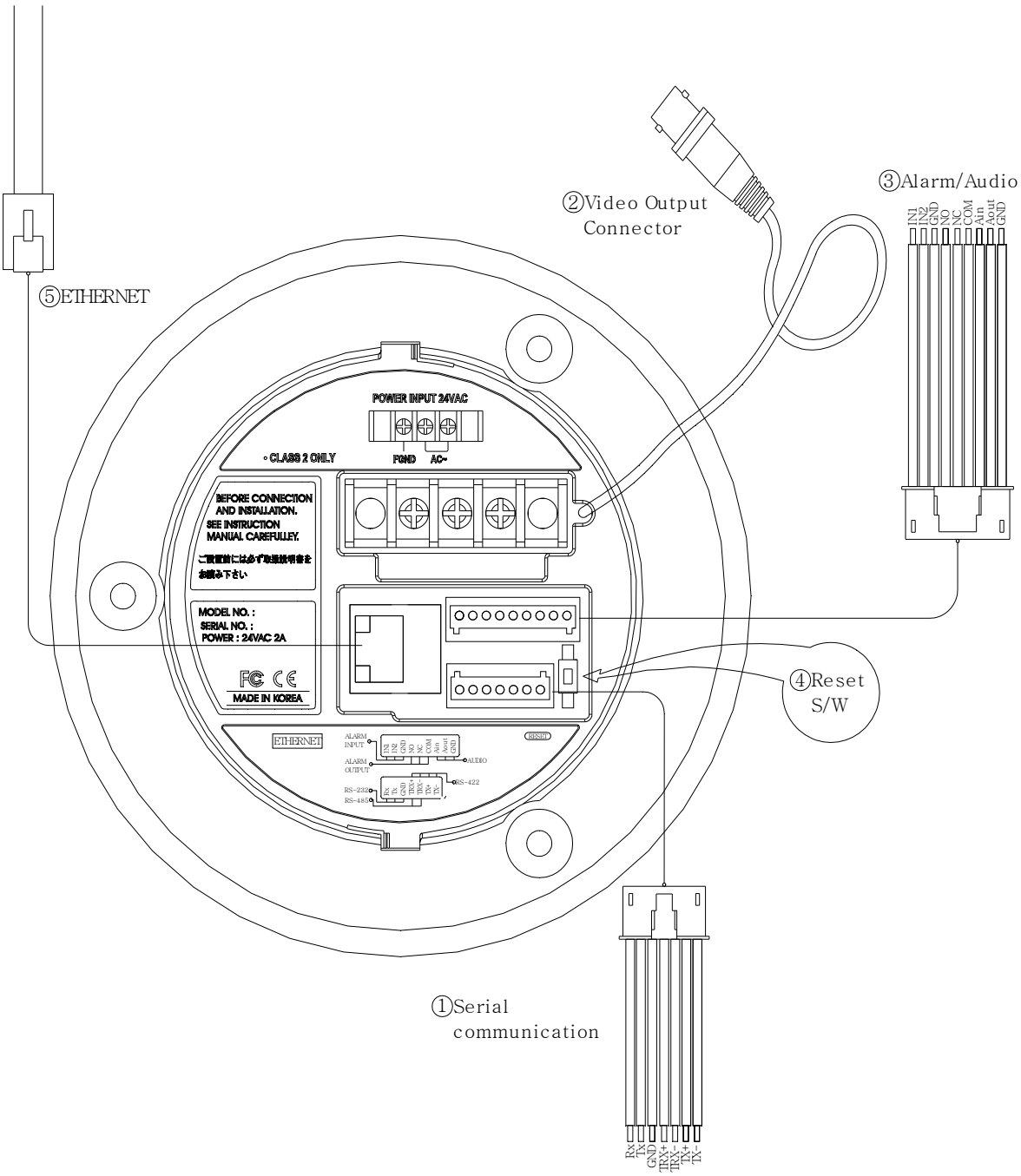


Figure 10. Connecting Wiring

① 7 pin terminal block for serial communication

RS-232C Terminal Block is used for some devices such as POS terminal block.

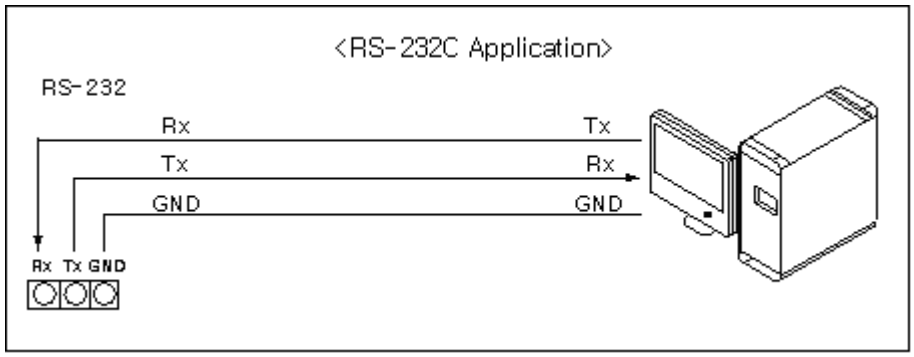


Figure 11. RS-232C Connection

The RS-485 serial port consists of TRX+(RX+) and TRX-(RX-) as following Figure 12.

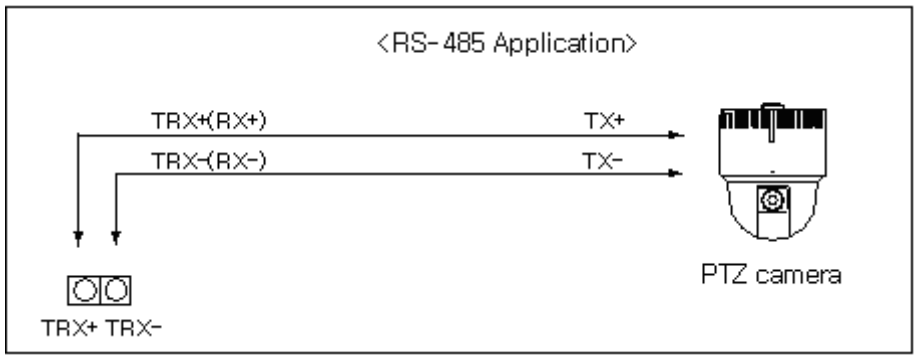


Figure 12. RS-485 Connection

The RS-422 serial port consists of TRX+(RX+), TRX-(RX-), TX+ and TX- as following Figure 13.

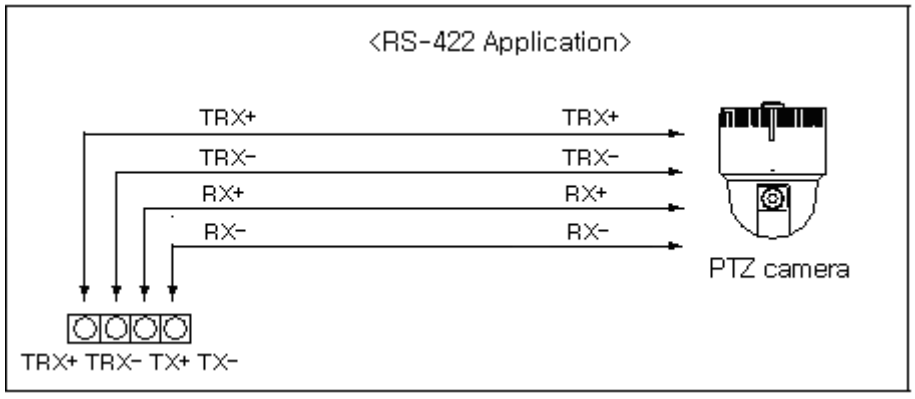


Figure 13. RS-422 Connection

② BNC connector for video loop out
Connect the video out (BNC) connector to the monitor or video input.

③ 9 pin terminal block for D/I, D/O and Audio

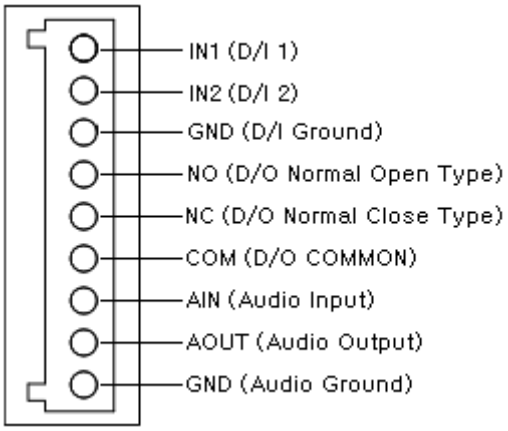


Figure 14. 9 pin terminal block for D/I, D/O and Audio

You can use external devices to signal the dome camera to react to events. Mechanical or electrical switches can be wired to the IN(Alarm In) and GND(Ground) connectors.

The dome camera can activate external devices such as buzzers or lights. Connect the device to the NC(NO)(Alarm Out) and COM(Common) connectors.

④ Reset Switch (Reset)
Reset switch is used for restarting NVE or resetting NVE as Factory Default (FD). Refer to '4.1. Factory Default Settings' for detailed procedures. (This function is not implemented yet)

⑤ LAN connector (Ethernet)
This is a RJ45 LAN connector for 10/100 Base-T Ethernet.

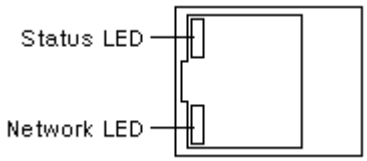


Figure 15. RJ45 LAN connector

⑥ Terminal block for the Power
Connect the power of AC 24V 2A to the dome camera.

4. Operation Description

4.1. Factory Default Settings

Factory default settings are as follows:
• IP address: 192.168.xx.yy (refer to 2.3 Serial Number / MAC Address)
• Mask: 255.255.0.0
• Gateway: 192.168.0.1
• User ID: root
• Password: pass

MAC address = 00-13-23-01-23-45 → IP address = 192.168.35.69

Convert the Hexadecimal number to Decimal number

Factory Default (FD) initialization procedure is as follows

1. Turn ON the power.
2. Press “Reset” button when Status LED at LAN connector start to blink very rapidly.
3. Release “Reset” button when Status LED at LAN connector is blinking slowly.

4.2. Rebooting

Reset can be carried out as follows:

1. Press Reset for 1 second.
   When Reset function is activated, Status LED and Network LED at LAN connector will blink together, twice. User may stop pressing Reset at this point.
2. When “Reset” function has been completed, LEDs will stop blinking.

4.3. On Screen Menu

Please refer to “On Screen Menu Operation Manual of IPC PTZ Type Camera.pdf”.

5. TECHNICAL SPECIFICATIONS

Camera : 25XDN	
Minimum Illumination	1.0 lx (30 IRE) ; Day & Night Off (Color) 0.1 lx (30 IRE) ; Day & Night On (Black & White) 0.01 lx ; Slow Shutter X 128 On 0.001 lx(30IRE) ; Day & Night On(Black & White) + DSS
Lens	25X Optical Zoom with Auto Focus(10X Digital Zoom) (F=1.6 ~ 3.7, 50IRE, 3.8mm~95mm)
S/N ratio	50dB
Minimum object distance	0.1m
Camera: 23X	
Minimum Illumination	1.0 lx (30 IRE)
Lens	23X Optical Zoom with Auto Focus(10X Digital Zoom) (F=1.6 ~ 3.8, 50IRE, 3.8mm~87.4mm)
S/N ratio	49dB
Minimum object distance	1m
General	
Certification	CE EMC, FCC CLASS A
Image Sensor NTSC	1/4" SONY Super HAD CCD, 768(H) x 494(V)
PAL	1/4" SONY Super HAD CCD, 752(H) x 582(V)
Horizontal Resolution	470/460 lines(NTSC/PAL)
Pan Angle	360° Continuous rotation
Manual Speed	0.1° to 90° /sec. (Proportional to zoom) Turbo speed: 430°/sec (Press “CTRL” and move the joystick)
Preset Speed	500°/sec. maximum (OPT : 430, 360)
Tilt Angle	0°to 94° (User selectable to prevent obstruction of the horizontal view)
Manual Speed	0.1°to 90°/sec. (Proportional to zoom)
ID (Camera Address)	999 Selectable Address
Preset Position	319 Positions with camera status (16Characters input)
Alarm Out	4 Relays 24 VDC/1A Max (Selectable NC/NO)
Alarm Input	8 Input normal open dry contact (Programmable NC/NO)
On-Screen Display	Displays camera ID, Pan/Tilt Angle, Flip, Zoom, Privacy Zone
Tour	8 Guard Tours (Preset , Pattern, Auto Scan, Tour Input)
Pattern	4 Pattern, 240sec Memory
Flip	Rotate 180 at bottom of tilt
Communication Type	RS-485/422,Baud Rate: 9600bps(STD), (OPT : 38400, 4800, 2400)
Micro Step	0.01°
Access Time	0.75 second maximum preset recall time

Electrical	
Environmental	
Ambient Environment Temperature	-20℃ to 60℃(-4°F~140°F)
Operating Humidity	0~90% RH(Non-Condensing)
Storage Temperature	-30℃ to 70℃(-22°F~158°F)
Mechanical	
Construction	Aluminum steel and Plastic
Finish	Polyester Power Coat
Dome Bubble	Polycarbonate
Dimensions	See Figure 12-A,B
Ratings	IP 66
Weight	Approx.6Kg

Power Consumption

Heater & Cooler OFF	Voltage [DC, V]	24.0
	Current [mA]	981
	Power [W]	23.54
Heater ON	Voltage [DC, V]	24.0
	Current [mA]	1846
	Power [W]	44.30
Heater & Cooler ON	Voltage [DC, V]	24.0
	Current [mA]	1956
	Power [W]	46.94

* Heater: 865[mA], Cooler110 [mA]

6. DIMENSIONS

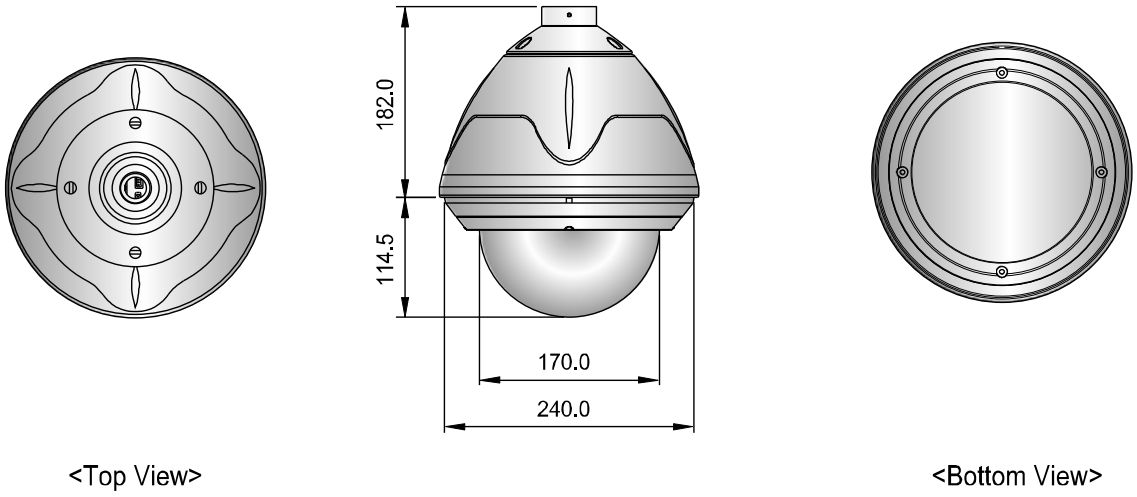


Figure 16-A Cyber Scan Pre-Pack Dome

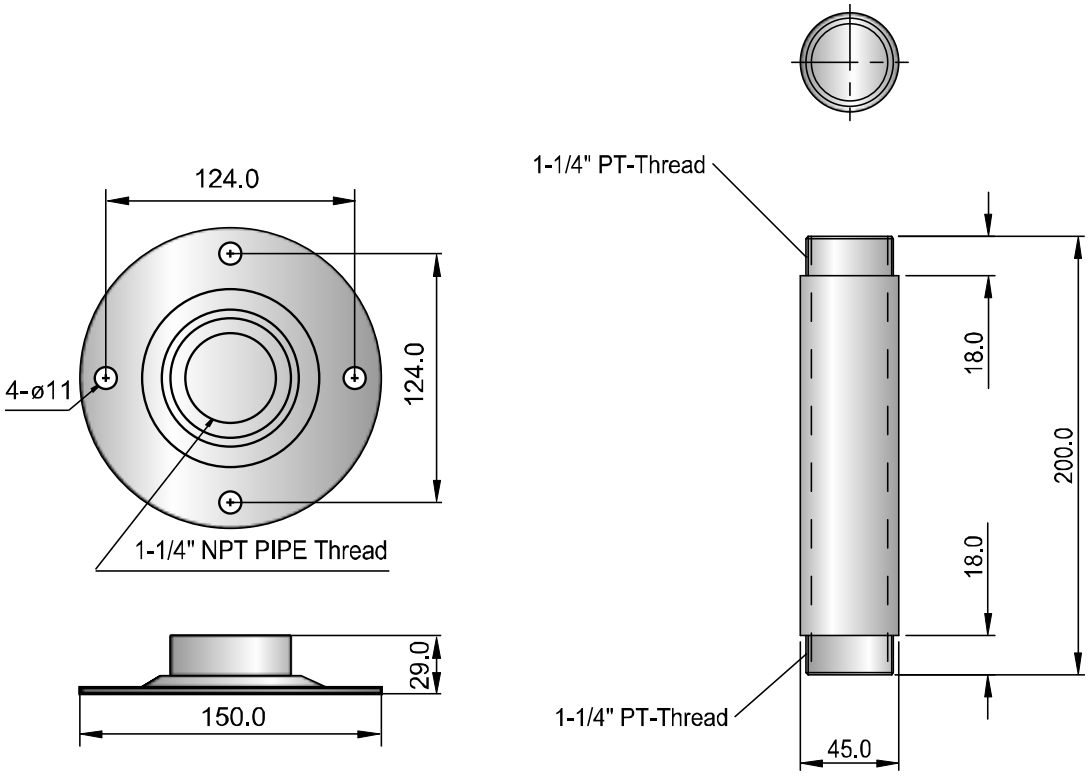


Figure 16-B Ceiling Mount Bracket / Joint Pipe

APPENDIX A - The List of GLB(Short) Key

If you use Cyber Scan Pre-Pack dome camera and Joystick controller, you can use the following GLB short cut key for the easy operations without accessing the main menu of the dome unit.(Cyber Scan protocol only)

Note : Press ***GLB***, after press the numeric button. This function is available subject to Global mode on, in the main menu (Refer to Page40)

GLB Key	Function	ON/Off	RMK
1. Camera Funtions			
11 12	Privacy Zone	Off On	
13 14	Over Tilt	Off On	
20 21 22	Day/Night	Auto Off On	
23 24	Digitla Zoom	Off On	
25 26	Back Light	Off On	
27 28 29	WB(White Balace)	ATW Indoor Outdoor	
31 32	Flickerless	Off On	
33 34	Auto Focus	Auto Manual	
35 36	BMB(Black Mask BLC) Mode	Off On	
180 181-194 195	Zoom Speed	Minimum 1~14 step Maximum	Press Number + CTRL +GLB
2. Display Function (OSD)			
71 72	All display	Off On	
73	Zoom Magnitude	On/Off	Toggle
74	Dome ID	On/Off	Toggle
75	Dome Mode	On/Off	Toggle
76	Pan/Tilt Angle	On/Off	Toggle
77	Area Title	On/Off	Toggle
78	Operation Title	On/Off	Toggle
79	Flag Display	On/Off	Toggle
80	Time Display	On/Off	Toggle

GLB Key	Function	ON/Off	RMK
3. Dome Operations Functions			
81 82	Flip	Off On	
83 84	Mirror/Reverse	Off Reverse	
91 92 93	Cooler	Auto Off On	
94 95 96	Heater	Auto Off On	

APPENDIX B - TROUBLE SHOOTING

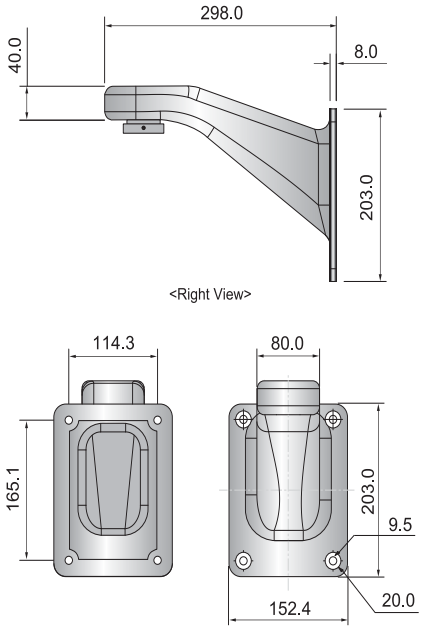
If problems occur, verify the installation of the camera with the instructions in this manual and with other operating equipment. Isolate the problem to the specific pieces of equipment in the system and refer to the equipment manual for further information.

Problem	Possible Solution
No Video	a. Verify that power is connected to all pieces of equipment in the system. b. Verify that the power switches are On position.
Poor Video Quality	a. Check the video connections (see Figure 10) b. Check that the BNC connectors are inserted properly. c. Check the Voltage level of the dome camera.
Dome Cameras lose their positions	a. Reset that camera using the Dome configuration menus. b. Check that the dome cameras are inserted properly in the base. c. Check the voltage level of the dome camera.
Camera number does not match the multiplexer number	Check the camera ID and insert the BNC cable into the proper input of the multiplexer.
Picture is torn when switching	Check Line Lock setting and adjust phase of L/L (See Page 36)
Global key no active	Check the Global mode on, in the main menu (See Page40)

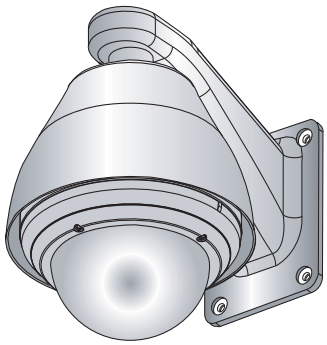
APPENDIX C - OPTIONAL ITEMS

1. HOUSING & ACCESSORY

A. WALL MOUNT BRACKET

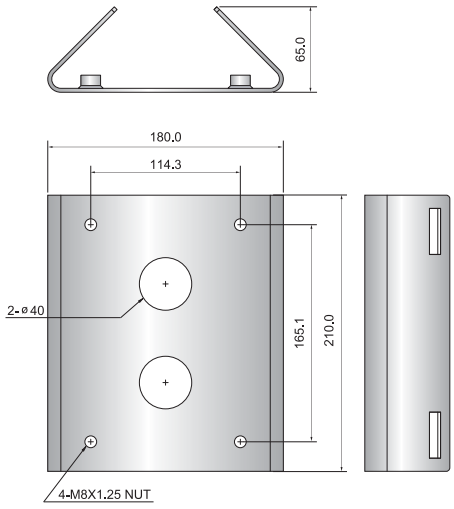


DIMENSION

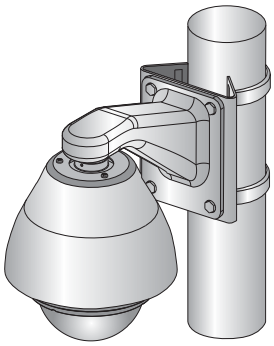


INSTALLATION

D. POLE MOUNT ADAPTOR

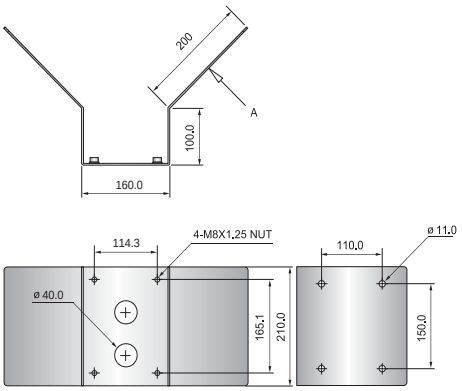


DIMENSION

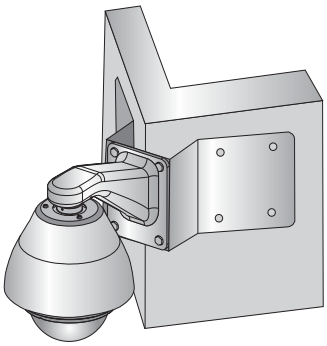


INSTALLATION

C. CORNER MOUT ADAPTOR

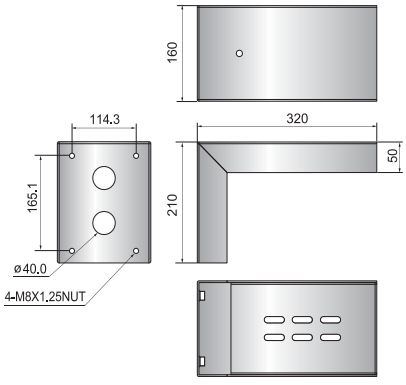


DIMENSION

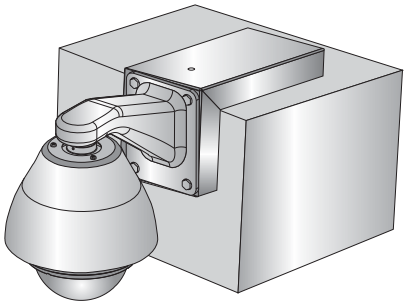


INSTALLATION

D. ROOT MOUNT ADAPTOR

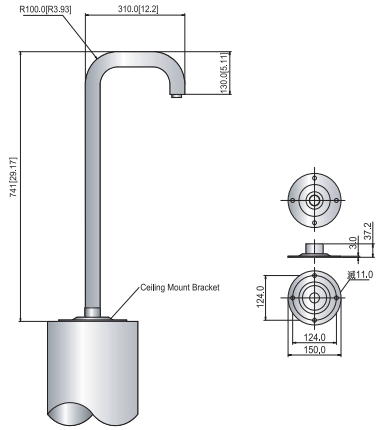


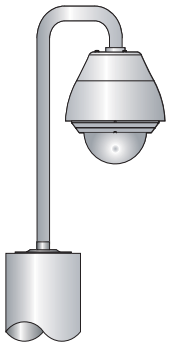
DIMENSION



INSTALLATION

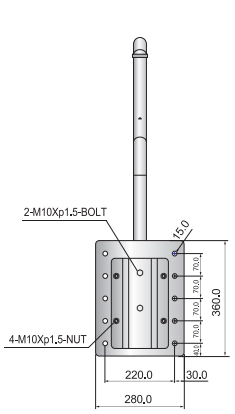
E.SWAN-NECK MOUNT BRACKET

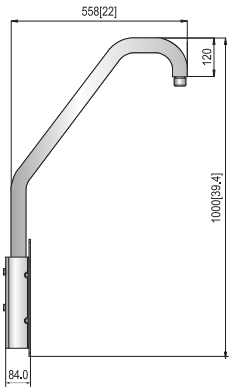


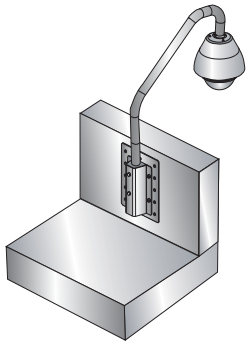


DIMENSION INSTALLATION

F. PARAPET WALL(SWING ARM) MOUNT BRACKET

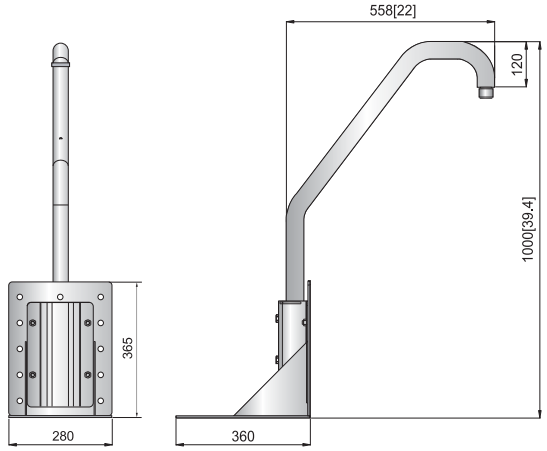




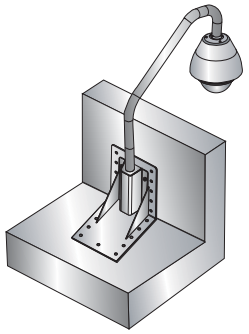


DIMENSION INSTALLATION

G. PARAPET ROOF TOP MOUNT BRACKET



DIMENSION



INSTALLATION

Revision history

Rev.	Date	Description
A	2007-03-29	Created.
B	2007-05-11	Added the information on the PTZ protocol of Hardware Revision 60 .
C	2008-10-14	Power Consumption is corrected
D	2009-05-04	Resolution modified (Half D1 -> 2CIF)