

# Integrated High Speed Dome Camera Installation Guide



Indoor

Version 3.7

## Preface

The information given in this manual was current when published. The company reserves the right to revise and improve its products. All specifications are subject to change without notice.

### Notice

This manual provides the installation information for the indoor integrated high speed dome. To work with the Dome Cameras, any installer or technician must have the following minimum qualifications:

- A basic knowledge of CCTV systems and components
- A basic knowledge of electrical wiring and low-voltage electrical hookups
- A basic knowledge of network system setting
- Have read this manual completely


### Copyright



Under copyright laws, the contents of this user manual may not be copied, photocopied, translated, reproduced or reduced to any electronic medium or machine-readable format, in whole or in part, without prior written permission of the company

### Important Information

Before proceeding, please read and observe all instructions and warnings in this manual. Retain this manual with the original bill of sale for future reference and, if necessary, warranty service. When unpacking your unit, check for missing or damaged items. If any item is missing, or if damage is evident, **DO NOT INSTALL OR OPERATE THIS PRODUCT**. Contact your dealer for assistance.

### Regulation

	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
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	<p>This symbol on the product or on its packaging indicates that this product shall not be treated as household waste in accordance with Directive 2002/96/EC. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By proper waste handling of this product you ensure that it has no negative consequences for the environment and human health, which could otherwise be caused if this product is thrown into the garbage bin. The recycling of materials will help to conserve natural resources.</p> <p>For more details information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.</p>
	<p>Compliance is evidenced by written declaration from our suppliers, assuring that any potential trace contamination levels of restricted substances are below the maximum level set by EU Directive 2002/95/EC, or are exempted due to their application.</p>

## Warnings and Cautions

- **Handle the camera carefully**

Do not abuse the camera. Avoid striking, shaking, etc. The camera could be damaged by improper handling or storage.

- **Installing electricity wiring carefully**

Ask qualified personnel of electrical wiring for the installation. Please note that input electricity to the unit is at tolerance of DC 12V/AC 24V  $\pm$  10%.

The camera is capable of surge protection; ensure AC power model unit grounded appropriately against damage of heavy current or electric shock.

- **Do not disassemble the camera**

To prevent electric shock, do not remove screws or covers. There are no user serviceable parts inside. Ask a qualified service person for servicing.

- **Do not block cooling holes on the bracket**

This camera has a cooling fan inside. Blocking the cooling holes leads to build up of heat the camera and may cause malfunction.

- **Do not operate the camera beyond the specified temperature, humidity or power source ratings**

Use the camera under conditions where temperature is between 0°C ~ 40°C (32°F ~ 104°F), and relative humidity is below 90%.

- **Do not expose the camera to rain or moisture, or try to operated it in wet areas**

This product is designed for indoor use or locations where it is protected from rain and moisture. Turn the power off immediately if the camera is wet and ask a qualified service person for servicing. Moisture can damage the camera and also create the danger of electric shock.

- **Do not use strong or abrasive detergents when cleaning the camera body**

Use a dry cloth to clean the camera when it is dirty. In case the dirt is hard to remove, use a mild detergent and wipe the camera gently.

- **Never face the camera towards the sun**

Do not aim the camera at bright objects. Whether the camera is in use or not, never aim it at the sun or other extremely bright objects. Otherwise, the camera may be smeared or damaged.

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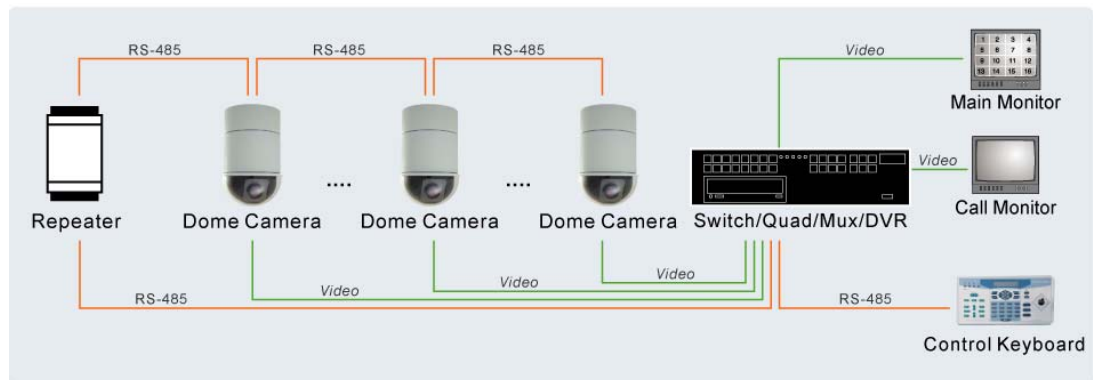
# 1. Introduction

The Integrated High Speed Dome Camera is designed to deliver superb performance and durability with an intelligent and stylish housing that is suitable in any security and surveillance installation. In addition, the Dome Camera supports one cabling for easy installation. Large set of built-in protocols, including DSCP, Pelco, VCL, Philips, AD-422 (Manchester), etc., provide connectivity to other suppliers' surveillance systems.

## General Operation Requirements:

A minimum of one control device is required for operation, such as a control keyboard, a DVR or a PC. The Integrated High Speed Dome Camera contains a built-in receiver that decodes commands originating from a control device.

Connect Dome Cameras to other devices, as shown in the diagram below, to complete a video surveillance system.



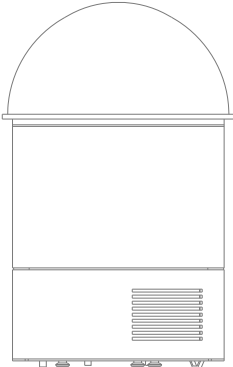

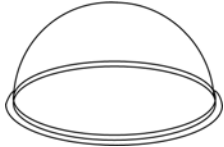
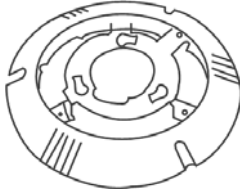


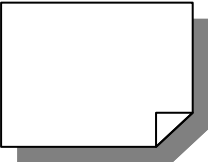

**NOTE:** To extend the network distance up to 1.2 km (4000 feet) and to protect the connected devices, it is highly recommended to place a repeater at the mid-point of the network. However, a repeater may be needed in the network distance less than 1.2 km if the used cables are not the CAT 5, 24-gauge cables; also see [3.2.4 RS-485 Connector Definition](#). Refer to the repeater's manual for detailed information.



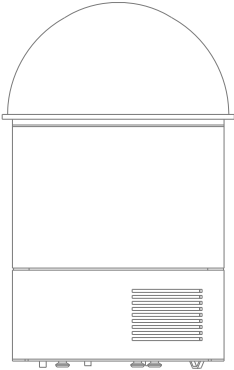
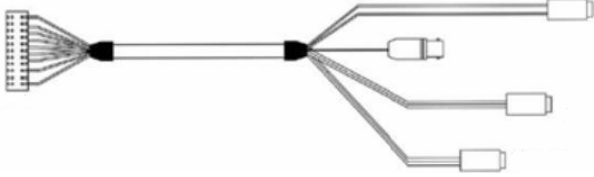
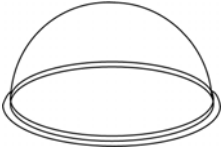
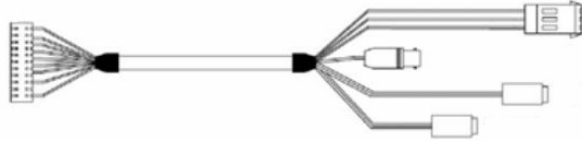

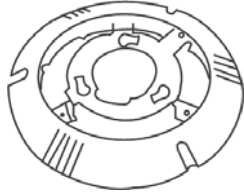
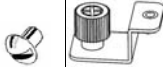
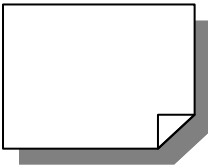

## 2. Standard Package Contents

Before proceeding, please check the box contains the items listed here. If any item is missing or has defects, DO NOT install or operate the product and contact your dealer for assistance.

### Analog Model

 <p>Camera Body</p>	 <p>Data Cable for Power Supply, Video and RS-485 (DC 12V)</p>	
 <p>Optical Cover</p>	 <p>Hard Ceiling Mount and Decoration Ring</p>	 <p>Fixing Plate</p>
 <p>Power Adaptor &amp; Power Cord (DC model only)</p>	 <p>Quick Guide</p>	 <p>CD: Operation Manuals</p>

### Network Model

 <p>Camera Body</p>	 <p>Data Cable for Power Supply, Video and Audio (DC 12V)</p>	
 <p>Optical Cover</p>	 <p>Data Cable for Power Supply, Video and Audio (AC 24V)</p>	
 <p>Power Adaptor &amp; Power Cord (DC model only)</p>	 <p>Hard Ceiling Mount and Decoration Ring</p>	 <p>M3 Screw, Fixing Plate</p>
 <p>Quick Guide</p>	 <p>CD: Operation Manuals</p>	

## 3. Camera Setups and Cable Connections

Before installing or connecting the Dome Camera, please refer to this section and complete preparations for dome setups and various switch settings.

There will be a PE cloth sheet covered inside the dome cover and a lens cap on the lens for shipping protection. Follow the steps below to remove those protective materials.

**Step 1:** Unpack the dome package and take out the dome body.

**Step 2:** Rotate and remove the protective cover.

**Step 3:** Remove the PE cloth sheet and take off the lens cap.

**Step 4:** Attach the dome cover to the dome body.

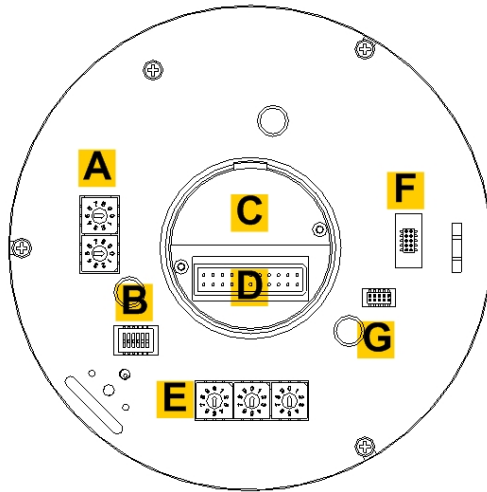
### 3.1 Dome Camera Setups

Before connecting the Dome Camera to other devices of CCTV system, please complete the Dome Camera's ID and communication switch settings. These switches are located on the bottom of the Dome Camera.

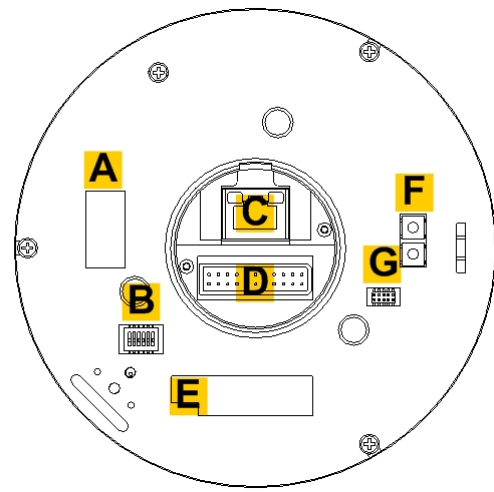
#### 3.1.1 Switch/Connector Definition

Configuring the Dome Camera's ID and communication protocol are required before connecting the analog camera to other devices. The switches used for configuring these settings are located on the bottom of the Dome Camera. Additionally, the 22-Pin Connector for Data Cable connection and ISP Connector for firmware upgrade kit connection are located on the back plate of both analog and network Speed Dome Cameras. Please refer to the diagrams and tables accompanied with for use of each switch/connector.

Please refer to the diagrams and tables of switch/connector definition below.



**Analog Model**



**Network Model**

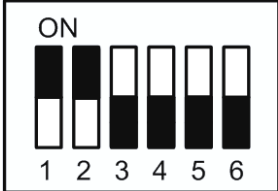
<b>A</b>	Camera Control Protocol Switch
<b>B</b>	Communication Switch
<b>C</b>	None
<b>D</b>	22-Pin Connector
<b>E</b>	ID Switch
<b>F</b>	Reserved
<b>G</b>	ISP Connector (for FW upgrade)

<b>A</b>	None	
<b>B</b>	Communication Switch (Reserved)	
<b>C</b>	RJ-45 Connector	
<b>D</b>	22-Pin Connector	
<b>E</b>	None	
<b>F</b>	F-1	Reboot Button
	F-2	Factory Reset Button
<b>G</b>	ISP Connector (for FW upgrade)	





**NOTE:** DO NOT change the network Speed Dome Camera's Communication Switch factory default settings.

### 3.1.2 Communication Switch Setting

Communication Switch		SW 1	RS-485 Setting
		SW 2	
		SW 3	Termination
		SW 4	Line Lock
		SW 5	Factory Default Reset
		SW 6	Reserved

RS-485 is the interface that communicates the Dome Camera and its control device; for this reason, the RS-485 setup of the dome and the control device must be the same. The RS-485 default setting is half-duplex (see the diagram follows). Please do not change the default setting without qualified specialist or supplier’s notice. As for the SW 3 and SW 4, they are used for termination and Line Lock adjustment respectively. The SW 5 is mainly used when users want to restore the camera to the factory default status; moreover, once firmware upgrade is carried out, users also need to reset the SW 5 afterward.

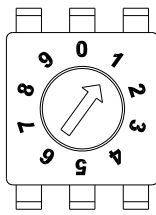
RS-485 Setting	
<p>Half-duplex</p> 	<p>Full-duplex</p> 

### 3.1.3 ID Setting

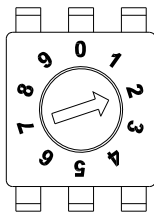
Please change the analog Dome Camera's ID if there is more than one Dome Camera on the same installation site. Use the switch to change your speed Dome Camera's ID by turning the arrow to the desired number respectively. For instance, if the camera's ID is 123, the ID switch should be set as below.



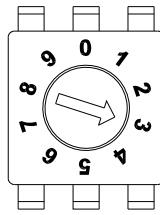
**NOTE:** No two Dome Cameras should be given the same ID, or communication conflict may occur.



Centesimal Digit



Decimal Digit



Single Digit



**NOTE:** The number "0" should locate upwards as shown in above diagram for correct switch definition.

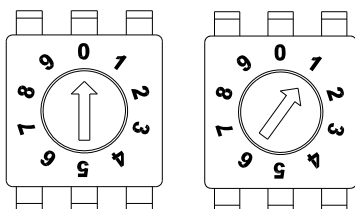
### 3.1.4 Camera Control Protocol Setting

Define the protocol you are going to use basing on the devices of your surveillance system. Generally, use one protocol even the devices are provided from different manufacturers. Use the switch to set your camera control protocol and the baud rate. Refer to the table below and turn the arrow to choose a protocol for your Dome Camera.

The table below shows various protocols with their matching switch numbers and baud rate.

Switch No.	Protocol	Baud Rate
00	VCL	9600
01	Pelco D	2400
02	Pelco P	4800
04	Chiper	9600
05	Philips	9600
07	DSCP	9600
08	AD422	4800
09	DM P	9600
11	Pelco D	4800
12	Pelco D	9600
13	Pelco P	2400
14	Pelco P	9600
15	JVC	9600
21	Kalatel-485	9600
22	Kalatel-422	4800

Select protocol: Pelco D, with switch no. 01 and baud rate 2400, for instance, the protocol switch should be set as shown below.



Decimal Digit      Single Digit



**NOTE:** The number “0” should locate upwards as shown in the diagram above for correct switch definition.

## 3.2 Cables and Connections

The Dome Camera is supplied with one integrated 22-pin Data Cable for connecting with the power, video, and RS-485/audio input & audio output cables. Please read the following sections thoroughly before making connections.

### 3.2.1 Cable Requirements

For operation, the Integrated High Speed Dome Cameras require video, RS-485 and power cables as described below:

- The video cable sends video signals to a remote viewing site. Using a coaxial BNC cable to send video signals is recommended.
- RS-485 cable carries commands from a control device to the analog Dome Cameras. A CAT 5, 24 gauge cable is recommended.
- Power supply: DC 12V/AC 24V output voltage



**NOTE:** Ensure power supply meets the Dome Camera's power requirement, or product impairment will occur. If any mistake happens, please contact with a qualified maintenance engineer.

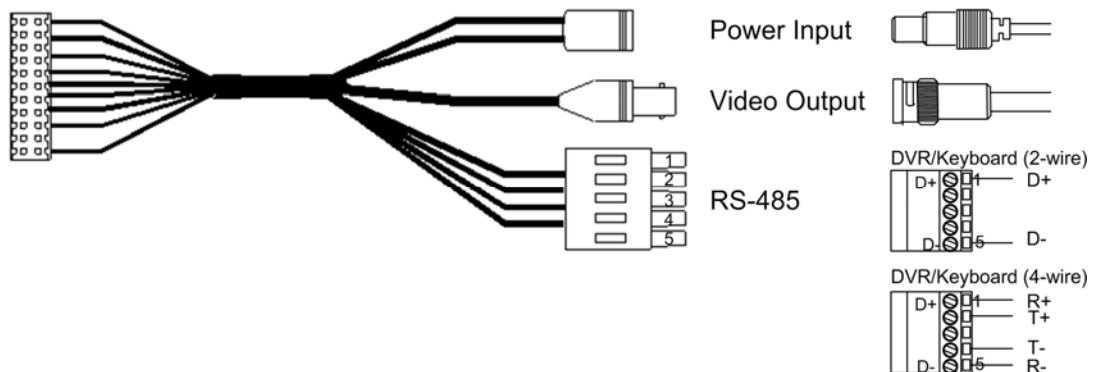
### 3.2.2 22-Pin Data Cable

The analog and network Speed Dome Cameras' Data Cables are illustrated as follows.

#### Analog Model

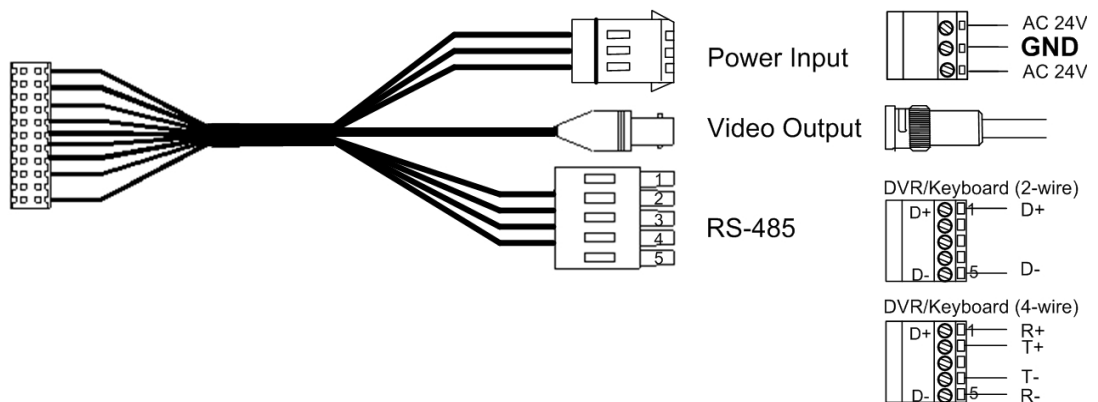
The analog Dome Camera's Data Cables are illustrated as shown below.

#### DC 12V Data Cable





### AC 24V Data Cable

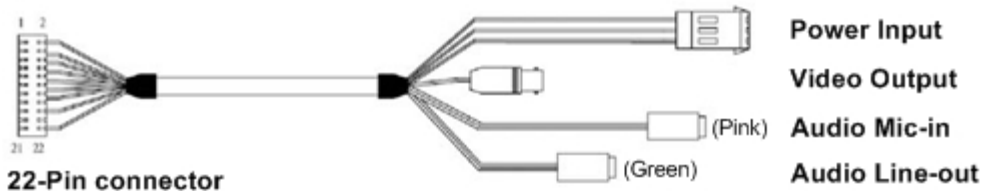


**NOTE:** Be careful not to pull the cables improperly during installation. Additionally, it is suggested to fasten the cables after cable connection is completed. Furthermore, when wiring the AC 24V power cable, make sure the **Ground** wire inserted into the mid-pin of the terminal block.

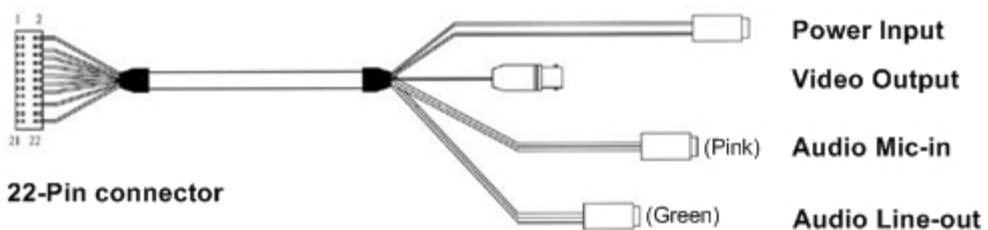
### Network Model

The network Dome Camera's Data Cables are illustrated as shown below.

#### AC 24V Data Cable

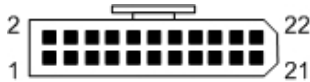


#### DC 12V Data Cable



### 3.2.3 22-Pin Connector Definition

With the 22-pin connector, installers can simply connect the power, video and RS-485 cables to the Dome Camera at once. Particularly, the alarm pins are serviceable for connecting alarm input and output devices, such as alarm sensors, sirens or flashing lights with the surveillance system. The analog and network Speed Dome Cameras' 22-pin connector definition will also be specified as follows.



#### Analog Model

The analog Dome Camera's 22-pin connector definition is listed as follows:

Pin	Definition	Cable
1	AC 24-1/DC (+)	20AWG/18AWG
2	ALM NC	
3	AC 24-2/DC (-)	20AWG/18AWG
4	ALM NO	
5	FG	20AWG/18AWG
6	ALM COM	
7	T+	24AWG
8	R-	
9	T-	
10	R+	
11	ISOG	

Pin	Definition	Cable
12	ALM-1	
13	ALM-3	
14	ALM-2	
15	ALM-4	
16	ALM-5	
17	ALM-6	
18	ALM-7	
19	ALM-8	
20	ALM GND	
21	VGND	20AWG
22	Video	

## Network Model

The network Speed Dome Camera's 22-pin connector definition is listed below:

Pin	Definition	Cable
1	AC 24-1/DC (+)	20AWG/18AWG
2	ALM NC	
3	AC 24-2/DC (-)	20AWG/18AWG
4	ALM NO	
5	FG	20AWG/18AWG
6	ALM COM	
7	Audio in	24AWG
8	Audio out	
9	Audio GND	
10	Audio GND	
11	ISOG	

Pin	Definition	Cable
12	ALM-1	
13	ALM-3	
14	ALM-2	
15	ALM-4	
16	Reserved	
17	Reserved	
18	Reserved	
19	Reserved	
20	ALM GND	
21	VGND	20AWG
22	Video	



**NOTE:** For alarm cable connection, please refer to [3.2.5 Cable Wiring and Connection](#).

### 3.2.4 RS-485 Connector Definition

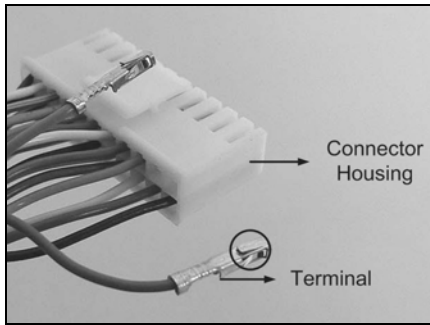
RS-485 is the interface that communicates the Dome Camera and its control device. Please connect the control keyboard to the speed dome through the terminal block. The recommended cables for RS-485 communication are **CAT 5** cables; maximum cable length for over 24-gauge wire is 4000 feet (1219 meters). If the total cable length exceeds 4000 feet, using a repeater to maintain the signals is recommended. Please refer to the figure and table below for pin definition and wiring.



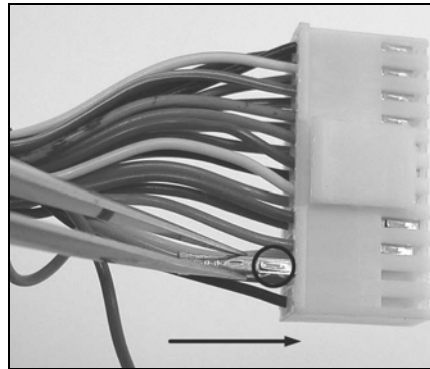
Pin	Corresponding Pins (22-Pin Connector)	Definition
1	7,10	T+, R+ (D+)
2~4	Reserved	
5	8,9	T-, R- (D-)

### 3.2.5 Cable Wiring and Connection

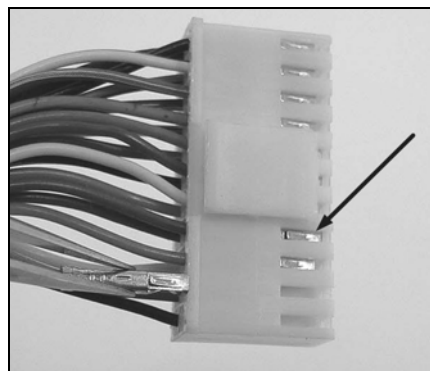
Users may need to conduct cable wiring when: (1) Connecting self-provided cords to the connector housing (shown in the figure below) instead of using the equipped data cable or (2) Connecting alarm input and output devices. The table follows will illustrate the way to wire cords into the connector housing (shown in the figures below).



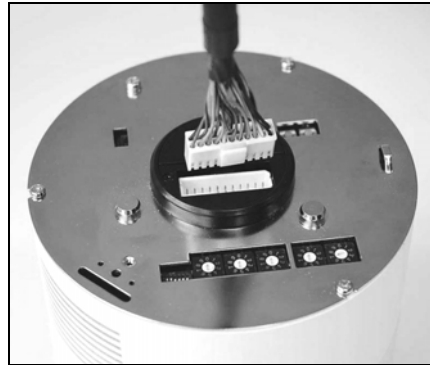
Insert the terminal into the pin holes on the connector housing, with the hook outward, as indicated in the figure.



To unlock the terminal, press the hook, as indicated in the figure, with a proper tool and pull it out gently.



Connect the 22-pin connector to the Dome Camera.



### 3.2.6 Ethernet Cable Connection

Connect one end of the CAT5 Ethernet cable to the RJ-45 connector of the network Speed Dome Camera, and the other end of the cable to the network switch or PC.



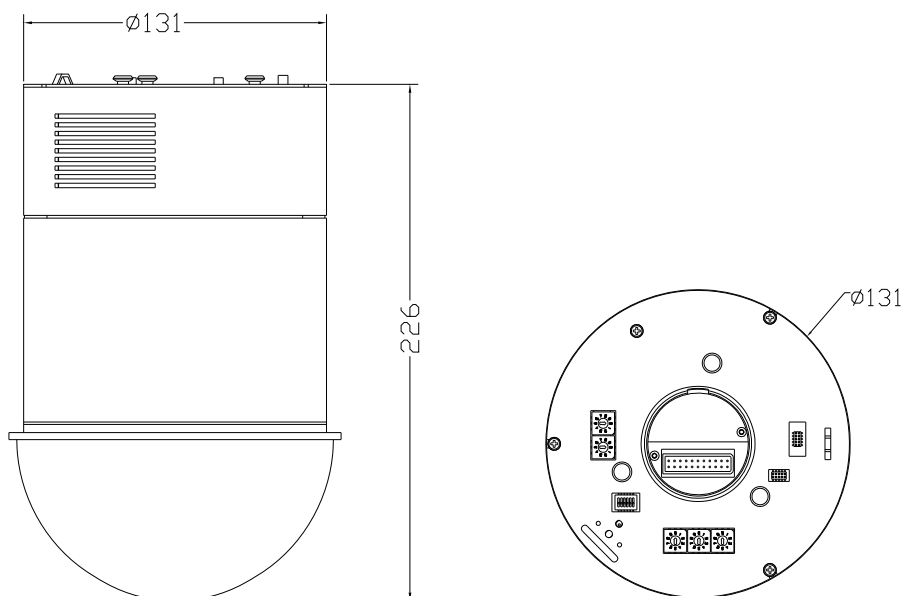
**NOTE:** In some cases, you may need use an Ethernet crossover cable when connecting the network Speed Dome Camera directly to the PC.

## 4. Dome Camera Installation

Basing on user's installation environments, the Dome Camera can be installed on ceiling, on wall or on pole. In the following sections, various indoor Dome Camera installation accessories, installation methods and installation procedures will be described in detail. In addition, the next section will provide the Dome Camera's dimensions for your reference before installation.





### 4.1 Camera Dimensions

The Dome Camera's dimensions are  $\varnothing 131 \times 226$  mm (5.2 x 8.9 Inches). The diagrams below show detailed dimensions for the Dome Camera's different parts.

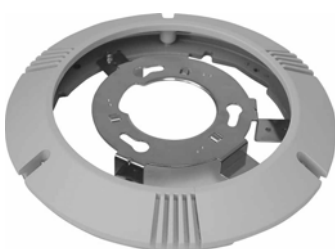
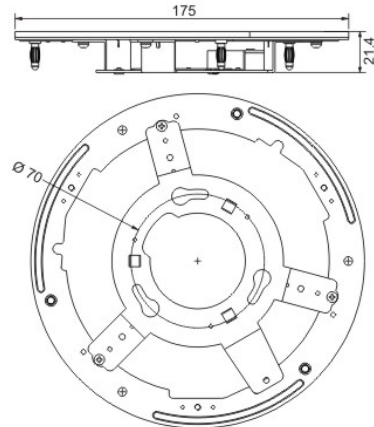


## 4.2 Optional Accessories

### Dome Camera Accessories

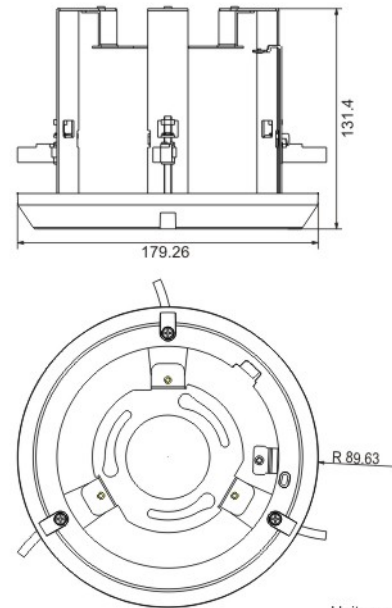
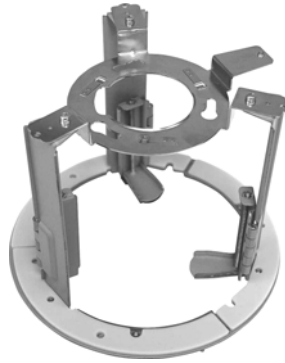
Transparent/Vandal Proof/Smoke Cover	
	
<p>Transparent Cover (Standard) Vandal Proof Cover (Optional)</p>	<p>Smoke Cover</p>
Power Adapter	
<p>77H07-A1015 (Input: 100~115VAC/Output: 24VAC 36VA) 77H07-A2015 (Input: 220~230VAC/Output: 24VAC 36VA)</p>	
	
	<p><b>NOTE:</b> When wiring, make sure the G/Y wire (Ground) inserted into the mid-pin of the terminal block.</p>

### Mounting Accessories

Hard Ceiling Mount (Standard Equipment)	
<p>For hard ceiling use. Height: 21.4mm ; Diameter of the three holes: 4.5mm ; Diameter of the bracket: 158mm</p>	
	 <p style="text-align: right;">Unit: mm</p>

**T-Bar Ceiling Mount**

For in-ceiling Installation use. Height: 160 mm (6.3 inches); Diameter: 180 mm (7.1 inches); 0.5 kg (1.1 lbs)



Unit: mm

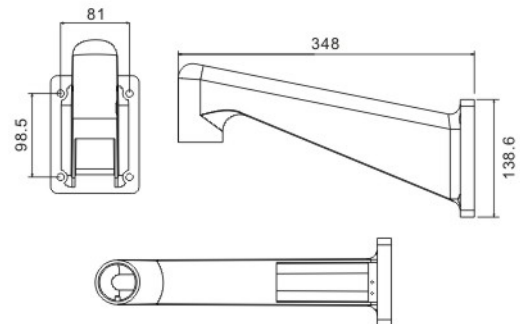
**Ceiling Panel**

For ceiling mounting. Zn plated; 610×305 mm (24×12 inches); Diameter: 155 mm (6.1 inches)



**Standard Pendant Mount**

White; 348×104×138.6 mm (13.7×4.1×5.5 inches); 1.5 kg (3.3 lbs); Diameter: 45 mm (1.8 inches). Supplied with M8x12 screw x1, spring washer-8 x1, pendent tube washer x1, rubber washer-8 x1 and sponge x2.



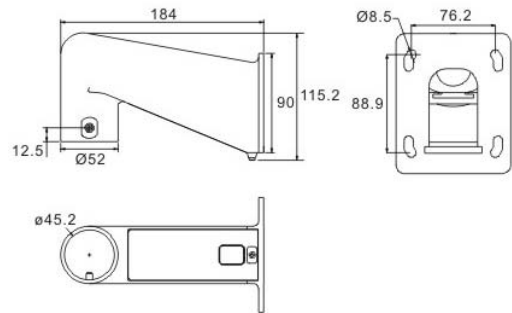
Unit: mm



**Compact Pendant Mount**

184x104x115.2 mm (7.24x4.09x4.54 inches); 0.6 kg (1.2 lbs)

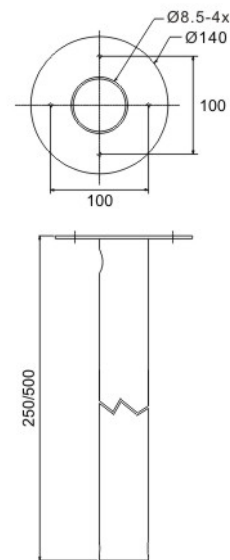
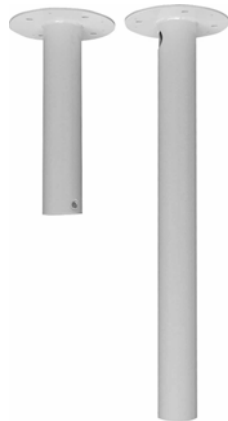
Supplied with rubber washer-8 x1, pendant tube washer x1, spring washer-8 x1 and M8x12 screw x1.



**Straight Tube**

Iron; Height: 250/500 mm (9.8/19.7 inches); Diameter: 50 mm (2 inches)

1 kg (2.2 lbs) / 1.8 kg (4 lbs). Supplied with M8x12 screw x1, spring washer-8 x1, pendant tube washer x1, rubber washer-8 x1 and waterproof rubber x1.



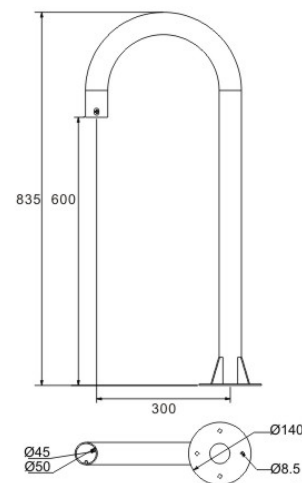
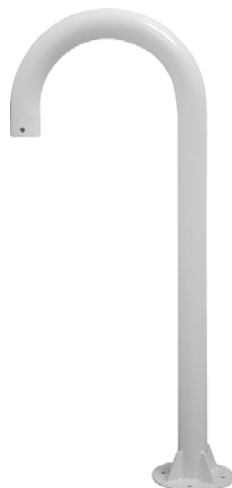
Unit: mm

**Swan Tube**

For mounting with Swan Tube.

White; Iron, Dimension: 835 x 300 mm (32.9x11.8 inches); Diameter: 45 mm (1.8 inches);

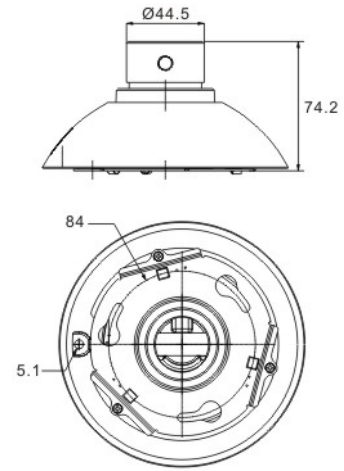
Weight: 3.8 kg (8.4 lbs); Supplied with pendant tube washer x1, rubber washer-8 x1, waterproof rubber x1, spring washer-8 x1 and M8x12 screw x1.



Unit: mm

**Indoor Mount Kit**

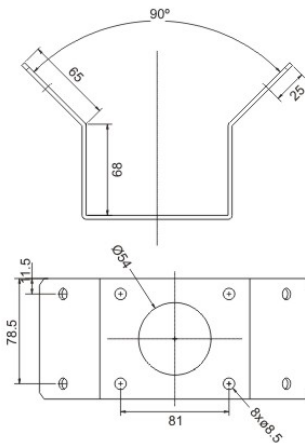
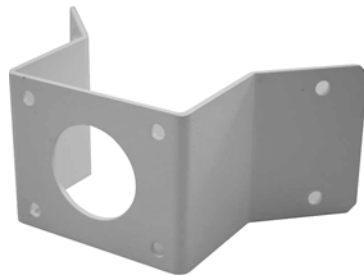
For mounting indoor Dome Camera onto a pendent mount/Straight Tube/ Swan Tube.  
 Diameter: 140 mm (5.5 inches); Height: 74 mm (2.9 inches); 0.3 kg (0.7 lbs)  
 Attached Components: Waterproof Rubber, Hexagon Key, Lock Screw Plate, M5x8 screwx1, M5x8 security screwx1, M3x6 screwx1



Unit: mm

**Corner Plate Mini**

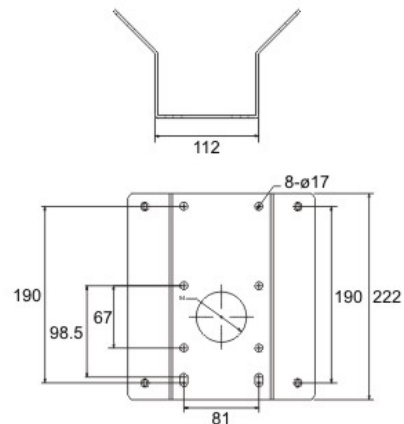
For mounting with Compact Pendent Mount.  
 270(L)×166(W)×95(D) mm (8.7×8×4.6 inches); Supplied with washer-8 x4, spring washer-8 x4, M8x16 screw x4 and M8 nut x4.



Unit: mm

**Corner Standard Mounting Plate**

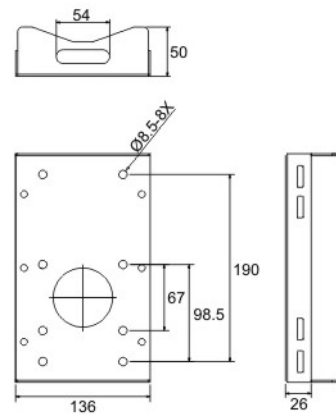
222(L)×204(W)×117(D) mm (8.7×8×4.6 inches); 2 kg (4.4 lbs). Supplied with washer-8 x4, spring washer-8 x4, M8x16 screw x4, and M8 nut x4.



Unit: mm

**Pole Thin Direct Mounting**

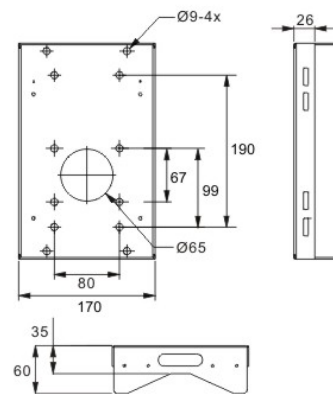
232(L)×136(W)×60(D) mm (9.1×5.4×2.4 inches); Diameter: 112~130 mm (4.4~5 inches); 0.7 kg (1.6 lbs). Supplied with stainless steel straps x4, M8x16 screw x4, washer x4 and spring washer-8 x4.



Unit: mm

**Pole Wide Direct Mounting**

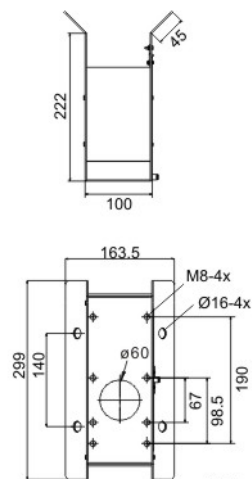
270(L)×170(W)×60(D) mm (10.6×6.7×2.4 inches); Diameter: 112~140 mm (4.4~5.5 inches); 1 kg (2.2 lbs). Supplied with M8x16 screw x4, washer x4, stainless steel straps x4 and spring washer-8 x4.



Unit: mm

**Corner Thin Box Mounting**

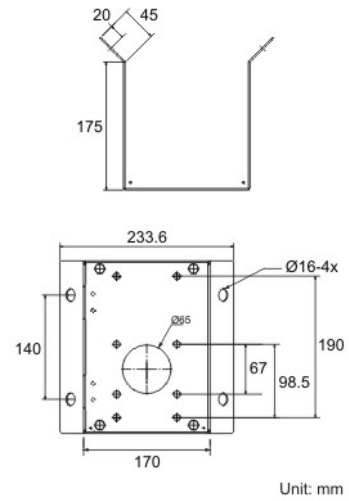
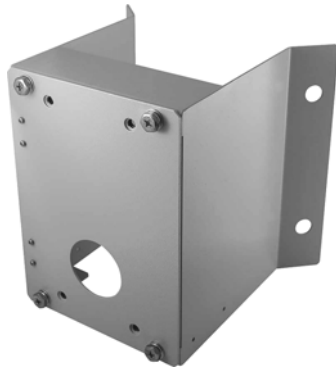
300(L)×164(W)×222(D) mm (11.8×6.5×8.7 inches); 3 kg (6.7 lbs); Supplied with M8x16 screw x4, washer-8 x4, and spring washer-8 x4.



Unit: mm

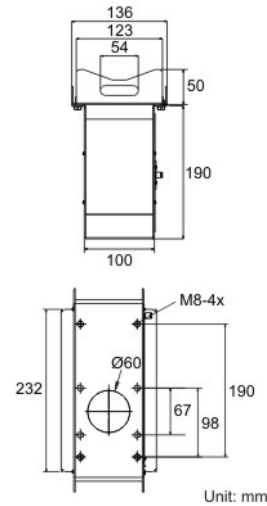
**Corner Wide Box Mounting**

232(L)×234(W)×210(D) mm (9.1×9.2×8.3 inches); 2.7 kg (6 lbs); Supplied with M8x16 screw x4, washer-8 x4, and spring washer-8 x4.



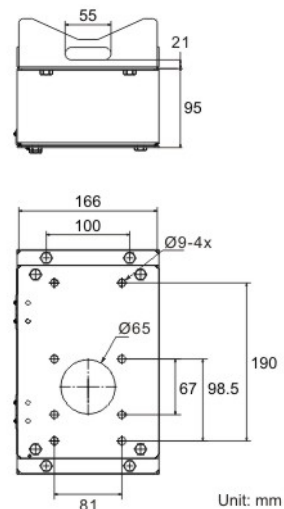
**Pole Thin Box Mounting**

291(L)×136(W)×242 (D) mm (11.5×5.4×9.5 inches); 3.1 kg (6.9 lbs); Supplied with M8x16 screw x4, washer-8 x4, spring washer x4 and stainless steel straps x4.



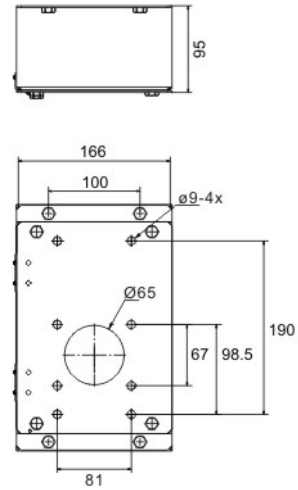
**Pole Wide Box Mounting**

270(L)×166(W)×155(D) mm (10.6×6.5×6.1 inches); 3.2 kg (7.1 lbs); Supplied with M8x16 screw x4, washer-8 x4, spring washer-8 x4 and stainless steel straps x4.



**Wall Box Mounting**

270(L)×166(W)×95(D) (10.6×6.5×3.7 inches); 2.2 kg (4.84 lbs); Supplied with M8x16 screw x4, washer-8 x4 and spring washer-8 x4.



**Stainless Steel Straps**

For fixing Pole Direct Mounting/ Pole Box on the pole.  
Length: 650 mm (25.6 inches); Width: 12.7mm; Weight: 50g (0.1 lb)



**Stainless Strap Cutter**

For tension, cut and crimp stainless steel straps. 1.4 kg (3.1 lbs)  
Suitable for straps width: 1/2", 5/8", 3/4"



**Other Application Accessories**

**Repeater/Converter**

D77R1: RS-485/RS-422 Repeater  
D77R2: RS-232 between RS-485/RS-422  
D77R3: Bi-phase to RS-485/RS-422



**Connector Box (Indoor Application)**

Recommended for wiring indoor dome alarm cables. White Color. 92x42 mm (3.7x1.7 inches); 0.13 kg (0.3 lbs); Supplied with cablex1, bracketx1 and M3x6 screwx2.



**Signal Distribution Unit**

Relay control codes to speed Dome Cameras.

Dimension: 432x44x90 mm (17x17.32x35.43 inches)

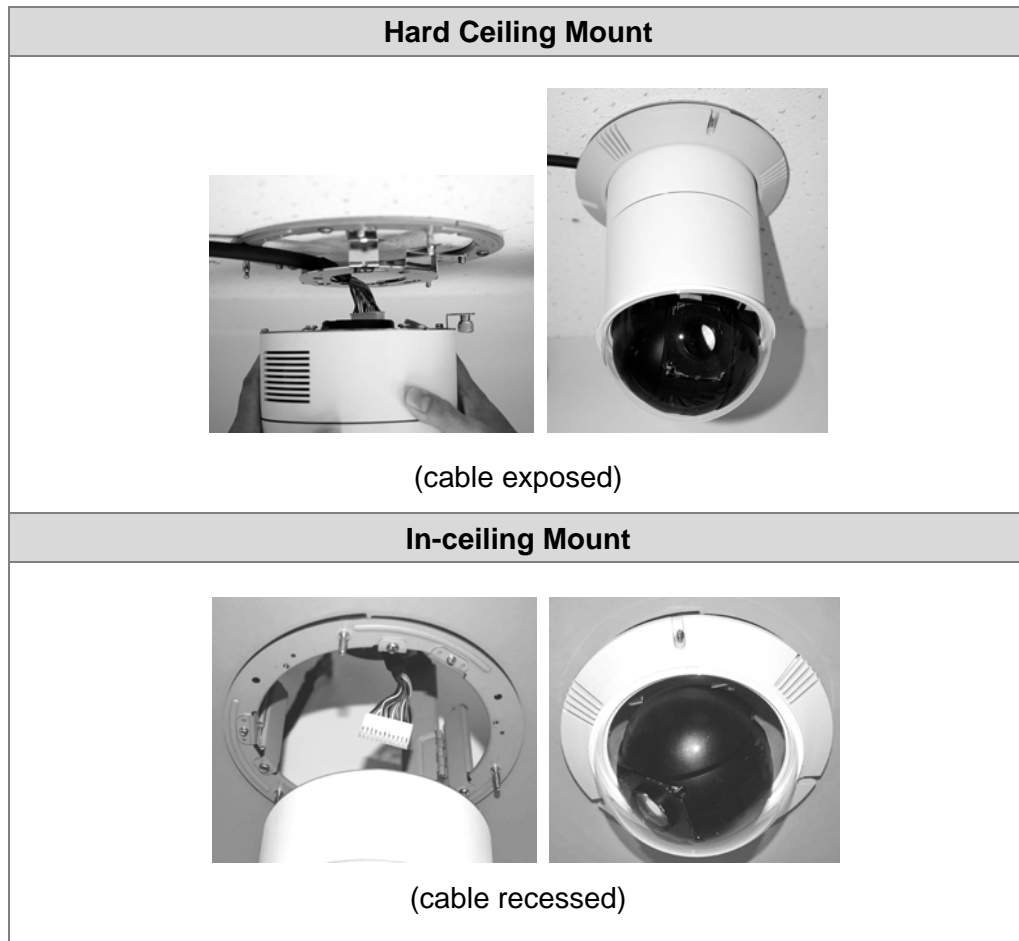


All photos of the accessories are subject to change without notice.

## 4.3 Ceiling Mount

Generally, there are three kinds of Dome Camera ceiling mounting methods: hard-ceiling, in-ceiling and mounting with Straight Tube. Refer to the following sections for more details.

The following figures show how cables connect to the Dome Camera in different ways.



### 4.3.1 Hard Ceiling Mounting

Hard Ceiling Mounting is a standard installation for an indoor Dome Camera, and general Mounting accessories are equipped in the standard indoor Dome Camera's package. Here lists the items and tools needed to mount the Dome Camera onto the ceilings. The supplied items are all in the Dome Camera's package.

**Items Needed:**

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Hard Ceiling Mount and Decoration Ring (supplied)
- Fixing Plate (supplied)

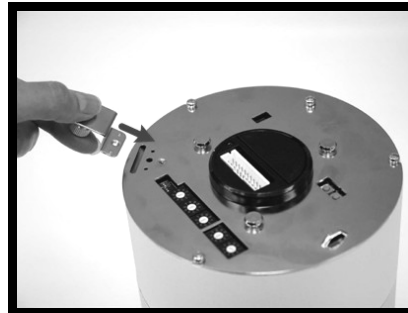
**Tools Needed:**

- Tool for drilling
- (+,-) Screw Driver

Follow the steps below to install the Dome Camera onto the ceiling.

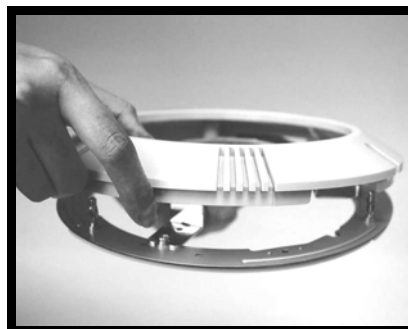
**STEP 1**

Screw the Fixing Plate to your Dome Camera's Body.



**STEP 2**

Remove the Decoration Ring from the Hard Ceiling Mount.





**STEP 3**

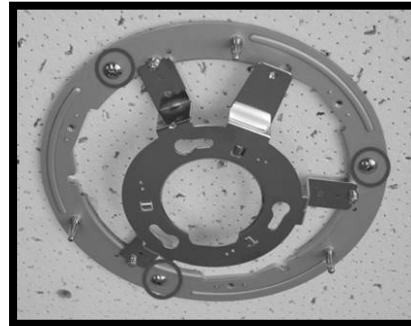
Attach the Mount onto the ceiling. Mark the locations where all the three ceiling holes should be set.

**STEP 4**

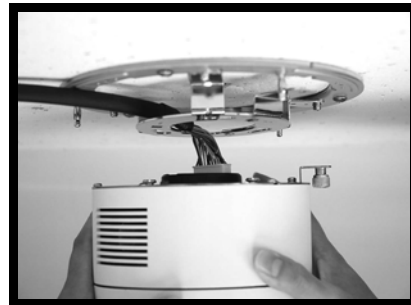
Drill these holes on the hard ceiling.

**STEP 5**

Fix the Mount to the holes on the hard ceiling with three screws, as marked in the figure.

**STEP 6**

Thread the Data Cable and/or Ethernet cable through the center hole of the Mount and connect the cable to the camera body.

**STEP 7**

Attach the camera body to the Mount and rotate the Dome Camera clockwise. Tighten the fixing screw, as marked in the figure, to fix the camera body.



**STEP 8**

Fix the decoration ring to the bracket.



**NOTE:** Make sure the optical cover is removed before carrying out the procedure.



**STEP 9**

Place the optical cover back to the Dome Camera.



**Completion**



### 4.3.2 In-Ceiling (T-Bar) Mounting

Here lists the items and tools needed to mount the Dome Camera into the ceilings. The supplied items are all in the Dome Camera package.

**Package Contents:**

- Lock Bar x1
- M3x6 Screw x2
- Ceiling Sticker x1
- C Ring x1

**Items Needed:**

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- T-Bar (optional accessory)
- Supplied Screw (equipped with T-Bar)
- Ceiling Sticker (equipped with T-Bar )
- Decoration Ring (supplied)

**Tools Needed:**

- Tool for cutting a circle on the ceiling
- (+,-) Screw Driver

Follow the steps to install the Dome Camera with T-Bar Ceiling mount accessory for in-ceiling mounting.

**Step 1:**

Disassemble the wing (indicated in the diagram) from the T-Bar Ceiling Mount, and take out the supplied screw in the small bag.



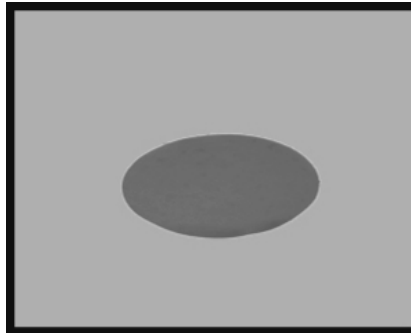
**Step 2:**

Attach the separated wing to the corresponding slot on the Dome Camera's back plate as shown in the figure.



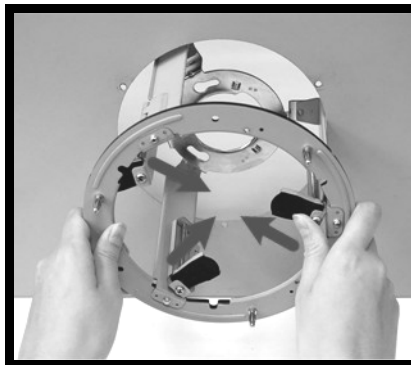
**STEP 3**

Place the Ceiling Sticker on the ceiling plate, and cut the circle part out of the ceiling.



**STEP 4**

Put up the T-Bar into the ceiling opening.

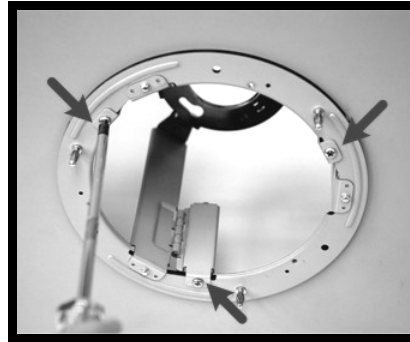


**STEP 5**

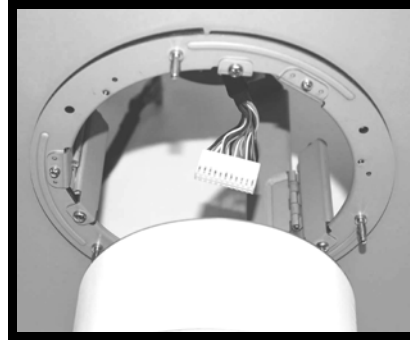
Rotate T-Bar wings of the hinge to fix the T-Bar at the edge of the ceiling opening.

**STEP 6**

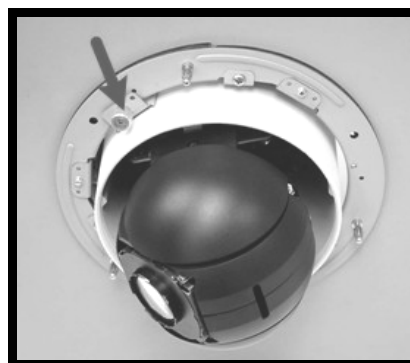
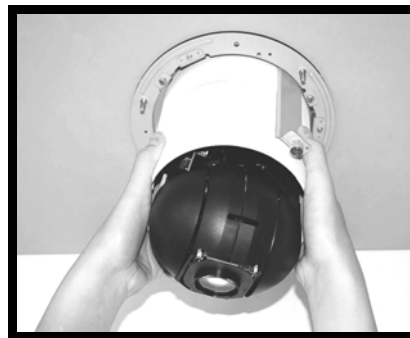
Tighten the screws, and the T-Bar wings will adhere to the ceiling.

**STEP 7**

Put the 22-pin Data Cable and/or Ethernet cable down through the center hole of the T-bar and connect it to the camera body.

**STEP 8**

Mount the camera body to the Bracket and rotate it clockwise. Tighten the fixing screw, as marked in the figure, to fix the Dome Camera.

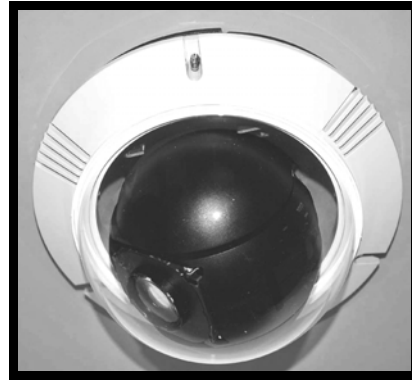


### STEP 9

Fix the Decoration Ring to the bracket and then place back the optical cover.

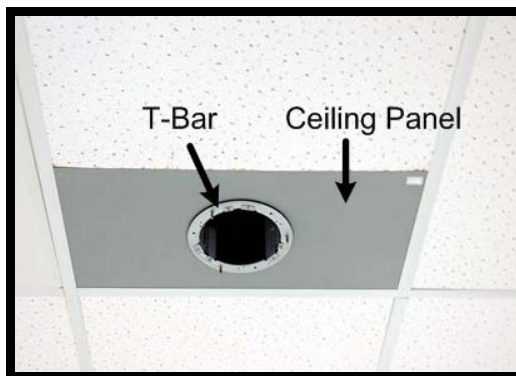


**NOTE:** Make sure the optical cover is removed before carrying out the procedure.



## 4.3.3 In-ceiling Mounting with Ceiling Panel

To mount the Dome Camera to a suspended ceiling with the T-Bar, the ceiling panel could be employed, as shown in the figure below.



Follow the steps below for installing the ceiling panel.

Step 1: Cut the ceiling half.

Step 2: Put the ceiling panel upward to the ceiling opening.

Step 3: Attach and fasten the T-Bar mount onto the panel (Refer to the previous section [4.2.2 In-ceiling Mounting](#) for further details).

### 4.3.4 Ceiling Mounting with Straight Tube

The Straight Tube is available in different length: 25 cm and 50 cm.

#### Package Contents:

- M8x12 Screw x1
- Spring Washer-8 x1
- Pendent Tube Washer x1
- Rubber Washer-8 x1
- Waterproof Rubber x1

#### Items Needed:

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Straight Tube and other equipped items (optional accessory)
- Indoor Mount Kit and attached components (optional accessory)
- Screws and Screw Anchors for fixing the Straight Tube onto the ceiling (not supplied)

#### Tools Needed:

- Tool for drilling
- Tool for screwing

Follow the steps to mount the Dome Camera with the Straight Tube.

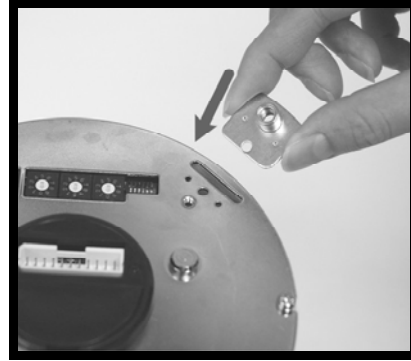
- 1) Ensure that the ceiling can support the weight of the Dome Camera and Straight Tube.
- 2) Make a cable entry hole on the ceiling.
- 3) Fix the suspension bracket to the ceiling with proper screws and screw anchors (not supplied).
- 4) Thread the cables through the Straight Tube and the Indoor Mount kit.



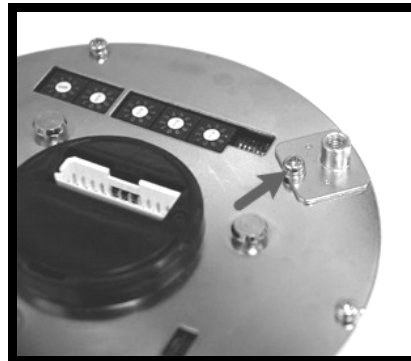
**NOTE :** After threading the cables, please block the cable entry hole with the supplied sponge(s) to avoid insects entering the tube.

- 5) Fix the Indoor Mount Kit to the Straight Tube with the supplied screws and washers.

**6)** Take out the Lock Screw Plate from the small bag in the Indoor Mount Kit's package and attach it to the Dome Camera's back plate, as shown in the picture.

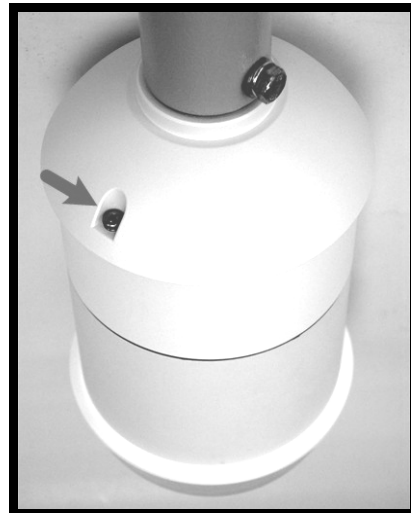


**7)** Fix the plate onto the Dome Camera's back plate with the supplied small screw, as marked in the figure.



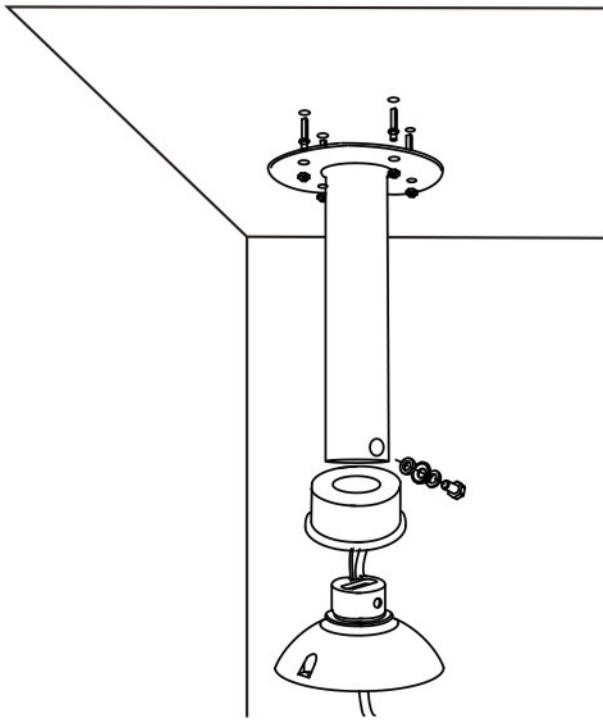
**8)** Connect the cables to the Dome Camera.

**9)** Mount the Dome Camera to the Indoor Mount Kit. (Ensure the Dome Camera is fixed completely, and the thread holes on the Lock Screw Plate and Indoor Mount Kit are aligned). Afterwards, screw the supplied M5 standard screw / security screw, as shown in the picture.





Ceiling Mounting: Straight Tube + Indoor Mount Kit



## 4.4 Wall Mount

The Dome Camera can be mounted on the wall with Compact Pendent Mount, Standard Pendent Mount and Wall Box. Please follow the installation instructions below for mounting the Dome Camera via different ways.

### 4.4.1 Swan Tube

**Package Contents:**

- M8x12 Screw x1
- Spring Washer-8 x1
- Pendent Tube Washer x1
- Rubber Washer-8 x1
- Waterproof Rubber x1

**Items Needed:**

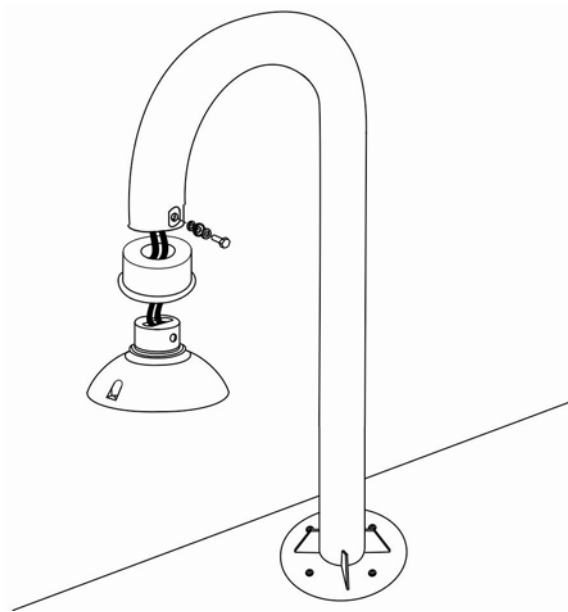
- Dome Camera
- Swan Tube and other equipped items (optional accessory)
- Waterproof Rubber (standard accessory)
- Screws and Screw Anchors for fixing the Swan Tube on the floor (not supplied).

**Tools Needed:**

- Tool for drilling
- Tool for screwing

Follow the steps to mount the dome with the Swan Tube.

- 1) Fix the Swan Tube on the floor with proper screws and screw anchors (not supplied).
- 2) Thread the cables through the Swan Tube and the Indoor Mounting Kit.
- 3) Fix the Indoor Mounting Kit to the Swan Tube with the supplied screws and washers. Then adjust the waterproof rubber to the junction of Swan Tube and Indoor Mounting Kit.
- 4) Connect the cables to the dome camera. Then attach the dome to the Indoor Mounting Kit and fix them with the supplied screw.

**Wall Mount: Swan Tube + Indoor Mounting Kit**

## 4.4.2 Compact Pendent Mount

**Package Contents:**

- Rubber Washer-8 x1
- Pendent Tube Washer x1
- Spring Washer-8 x1
- M8x12 Screw x1

**Items Needed:**

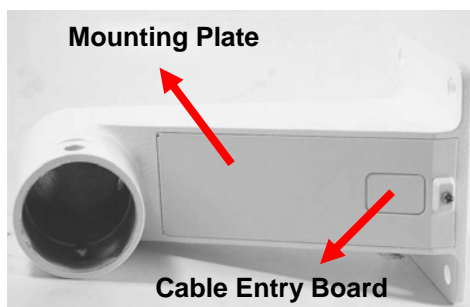
- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Compact Pendent Mount and equipped items (optional accessory)
- Indoor Mount Kit (optional accessory)
- Waterproof Rubber (Indoor Mount Kit's accessory )
- Screws and Screw Anchors for fixing the Compact Pendent Mount (not supplied)

**Tools Needed:**

- Tool for drilling
- Tool for screwing

Follow the steps below to mount the Dome Camera with the Compact Pendent Mount.

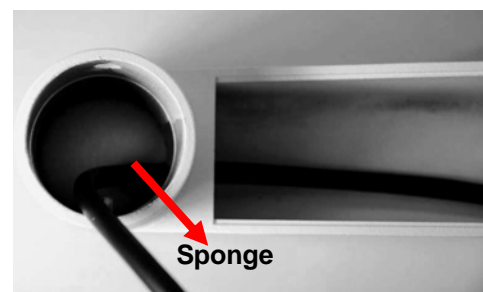
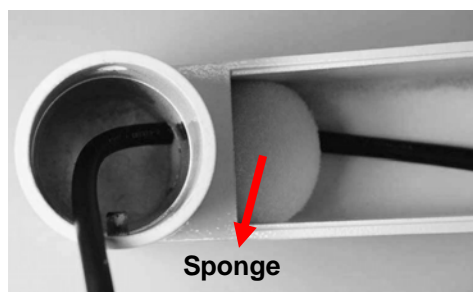
- 1) Make a cable entry hole on the wall to recess the cables. Otherwise, users could push up the Cable Entry Board on the Compact Pendent Mount's Mounting Plate to place the cables, as shown in the photo below.



- 2) Fix the Compact Pendent Mount on the wall with proper screws and screw anchors.
- 3) Attach the Waterproof Rubber to the Compact Pendent Mount.
- 4) Run the cable(s) through the Compact Pendent Mount with the Data Cable's 22-pin cable coming out of the outlet.



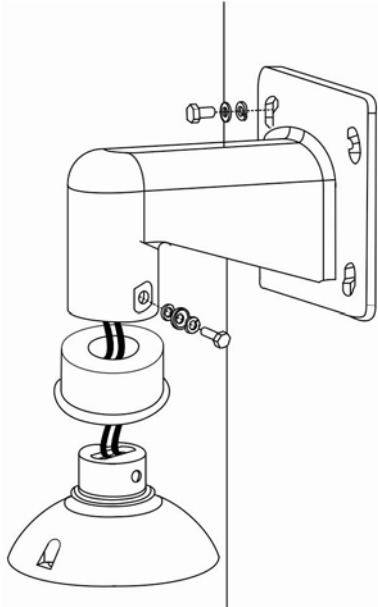
**NOTE:** Please block the cable entry hole with the supplied sponge to avoid insects entering the Pendent Mount. The sponge can be placed in two ways as shown in the illustrations below.



- 5) Thread the cable(s) through the Indoor Mount Kit and join the Indoor Mount Kit to the Compact Pendent Mount with the supplied screws and washers. Then adjust the Waterproof Rubber to the joint.

- 6) Connect the cable(s) to the Dome Camera.
- 7) Join the Dome Camera to the Indoor Mount Kit with the supplied screw and washers.

Wall Mounting: Compact Pendent Mount + Indoor Mount Kit



### 4.4.3 Standard Pendent Mount

**Package Contents:**

- M8x12 Screw x1
- Spring Washer-8 x1
- Pendent Tube Washer x1
- Rubber Washer-8 x1
- Sponge x2

**Items Needed:**

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Standard Pendent Mount and equipped items (optional accessory)
- Indoor Mount Kit (optional accessory)
- Waterproof Rubber (Indoor Mount Kit's accessory)
- Screws and Screw Anchors for fixing the Standard Pendent Mount onto the ceiling (not supplied)

**Tools Needed:**

- Tool for drilling
- Tool for screwing

Follow the steps below to mount the Dome Camera with the Standard Pendent Mount.

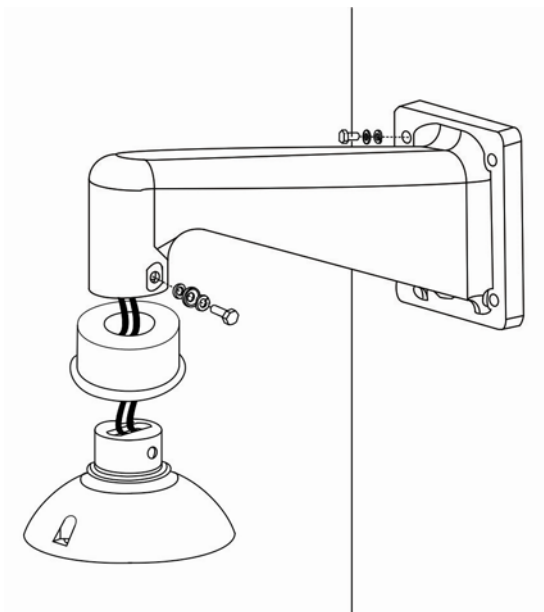
- 1) Make a cable entry hole on the wall to recess the cables. Otherwise, users could push up the cable entry board on the Standard Pendent Mount's mounting plate to place the cables (see the illustration in section [4.4.2 Compact Pendent Mount](#)> Step 1).
- 2) Fix the Standard Pendent Mount on the wall with proper screws and screw anchors.
- 3) Attach the Waterproof Rubber to the Standard Pendent Mount.
- 4) Run the cable(s) through the Standard Pendent Mount with the Data Cable's 22-pin cable coming out of the outlet.



**NOTE:** Please block the cable entry hole with the supplied sponge to avoid insects entering the Pendent Mount. See the illustrations in section [4.4.2 Compact Pendent Mount](#) > Step 4.

- 5) Thread the cable(s) through the Indoor Mount Kit and join the Indoor Mount Kit to the Standard Pendant Mount with the supplied screws and washers. Then adjust the Waterproof Rubber to the joint.
- 6) Connect the cable(s) to the Dome Camera.
- 7) Join the Dome Camera to the Indoor Mount Kit with the supplied screw and washers.

**Wall Mounting: Standard Pendant Mount + Indoor Mount Kit**



## 4.4.4 Wall Box Mounting

### Package Contents:

- M8x16 Screw x4
- Washer-8 x4
- Spring Washer-8 x4

### Items Needed:

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Standard/ Compact Pendent Mount and equipped items (optional accessory)
- Wall Box Mounting (optional accessory)
- Indoor Mount Kit (optional accessory)
- Waterproof Rubber (Indoor Mount Kit's accessory)
- Screws and Screw Anchors for fixing the Wall Box Mounting onto the ceiling (not supplied)

### Tools Needed:

- Tool for drilling
- Tool for screwing

Follow the steps to mount the Dome Camera with the Standard/ Compact Pendent Mount and Wall Box Mounting.

- 1) Make a cable entry hole on the wall to recess the cable(s).
- 2) Fix the Wall Box Mounting on the wall with proper screws and screw anchors. Then run the cable(s) through the hole on the Wall Box Mounting with the Data Cable's 22-pin cable coming out.
- 3) Fasten the Standard/ Compact Pendent Mount onto the Wall Box Mounting with the supplied screws and washers. Then thread the cable(s) through the Standard/ Compact Pendent Mount with the cable(s) coming out of the Pendent Mount's outlet.



**NOTE:** Please block the cable entry hole with the supplied sponge to avoid insects entering the Pendent Mount. See the illustrations in section [4.4.2 Compact Pendent Mount](#) > Step 4.

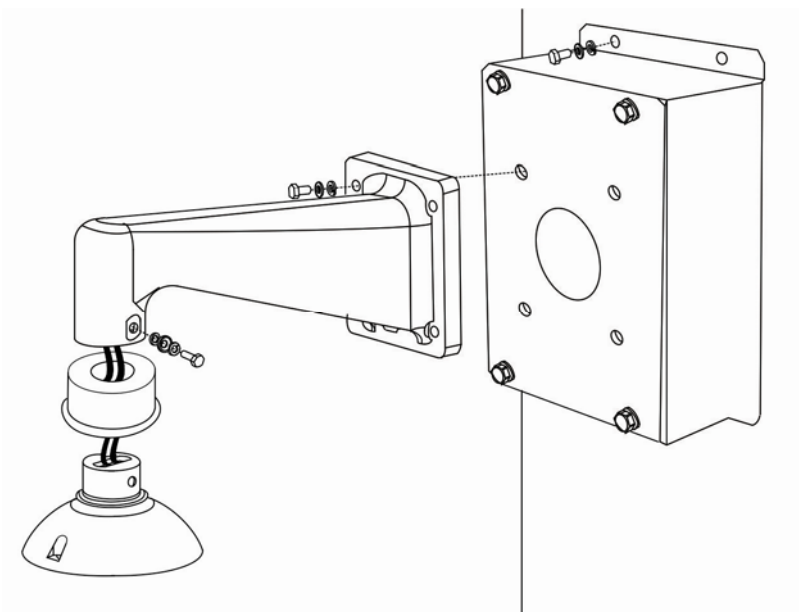
- 4) Attach the Waterproof Rubber to the Standard/ Compact Pendent Mount.
- 5) Thread the cable(s) through the Indoor Mount Kit and join the Indoor



Mount Kit to the Standard/ Compact Pendant Mount with the supplied screws and washers. Then adjust the Waterproof Rubber to the joint.

- 6) Connect the cable(s) to the Dome Camera.
- 7) Join the Dome Camera to the Indoor Mount Kit with the supplied screw and washers.

Wall Box Mounting: Wall Box Mounting + Standard/ Compact Pendant Mount + Indoor Mount Kit



## 4.5 Corner Mount

### 4.5.1 Corner Standard Mounting Plate/Corner Plate Mini

**Package Contents:**

- Washer-8 x4
- Spring Washer-8 x4
- M8x16 Screw x4
- M8 Nut x4

**Items Needed:**

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Standard/ Compact Pendent Mount and equipped items (optional accessory)
- Corner Standard Mounting Plate/Corner Plate Mini (herein collectively called “Corner Mounting Plate”; optional accessory)
- Indoor Mount Kit (optional accessory)
- Waterproof Rubber (Indoor Mount Kit’s accessory)
- Screws and Screw Anchors for fixing the Corner Mounting Plate (not supplied)

**Tools Needed:**

- Tool for drilling
- Tool for screwing

Follow the steps below to mount the Dome Camera with the Corner mounting Plate and Standard/ Compact Pendent Mount.

- 1) Make a cable entry hole on the wall to recess the cable(s).
- 2) Fix the Corner Mounting Plate on the corner of the wall with proper screws and screw anchors. Then run the cable(s) through the hole on the Corner Mounting Plate with the Data Cable’s 22-pin cable coming out.
- 3) Fasten the Standard/ Compact Pendent Mount onto the Corner Mounting Plate with the supplied screws and washers. Then thread the cable(s) through the Standard/ Compact Pendent Mount with the cable(s) coming out of the Pendent Mount’s outlet.

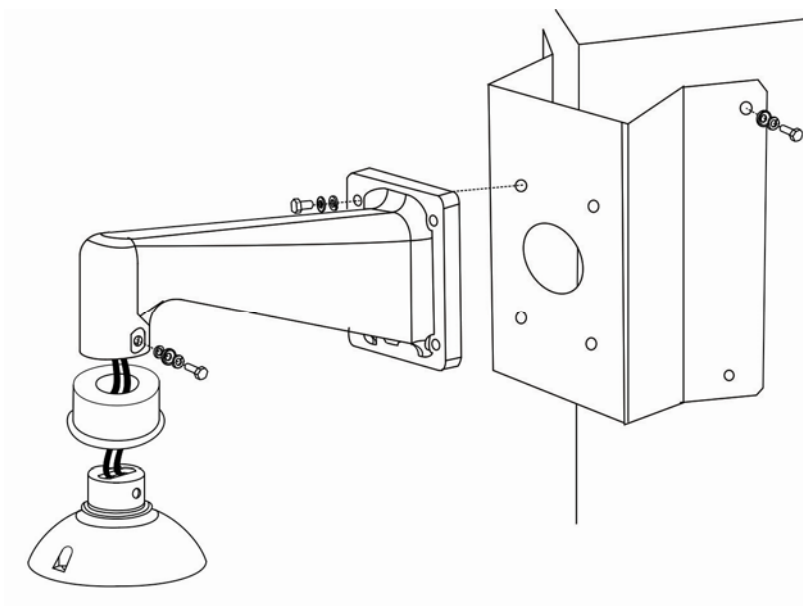


**NOTE:** Please block the cable entry hole with the supplied sponge

to avoid insects entering the Pendant Mount. See the illustrations in section [4.4.2 Compact Pendant Mount](#) > Step 4.

- 4) Attach the Waterproof Rubber to the Standard/ Compact Pendant Mount.
- 5) Thread the cable(s) through the Indoor Mount Kit and join the Indoor Mount Kit to the Standard/ Compact Pendant Mount with the supplied screws and washers. Then adjust the Waterproof Rubber to the joint.
- 6) Connect the cable(s) to the Dome Camera.
- 7) Join the Dome Camera to the Indoor Mount Kit with the supplied screw and washers.

#### Corner Wall Mounting: Corner Standard/Mini Mounting Plate + Standard/ Compact Pendant Mount + Indoor Mount Kit



## 4.5.2 Corner Thin/Wide Box Mounting

### Package Contents:

- M8x16 Screw x4
- Washer-8 x4
- Spring Washer-8 x4

### Items Needed:

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Standard/ Compact Pendent Mount and equipped items (optional accessory)
- Corner Thin/Wide Box (optional accessory)
- Indoor Mount Kit (optional accessory)
- Waterproof Rubber (Indoor Mount Kit's accessory)
- Screws and Screw Anchors for fixing the Corner Thin/Wide Box (not supplied)

### Tools Needed:

- Tool for drilling
- Tool for screwing

Follow the steps below to mount the Dome Camera with the Corner Thin/Wide Box and Standard/ Compact Pendent Mount.

- 1) Make a cable entry hole on the wall to recess the cable(s).
- 2) Fix the Corner Thin/Wide Box on the corner of the wall with proper screws and screw anchors. Then run the cable(s) through the hole on the Corner Mounting Plate with the Data Cable's 22-pin cable coming out.
- 3) Fasten the Standard/ Compact Pendent Mount onto the Corner Thin/Wide Box with the supplied screws and washers. Then thread the cable(s) through the Standard/ Compact Pendent Mount with the cable(s) coming out of the Pendent Mount's outlet.

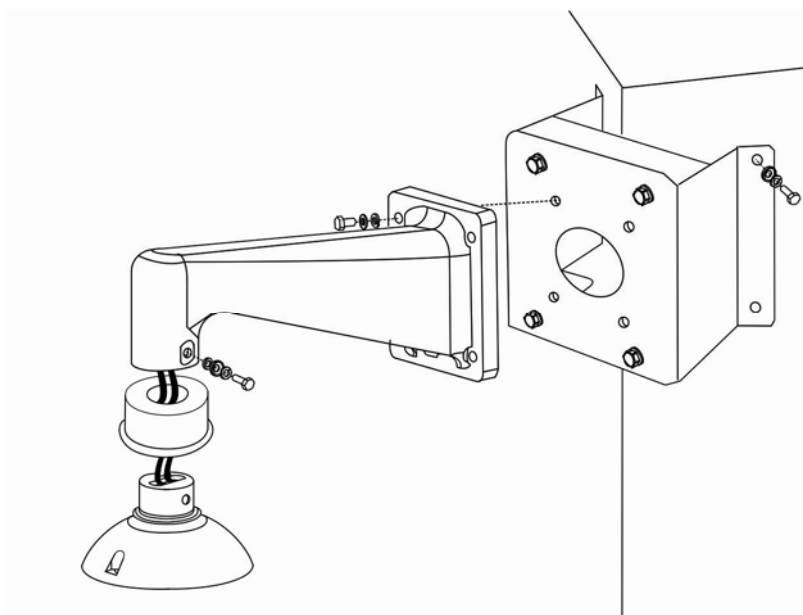


**NOTE:** Please block the cable entry hole with the supplied sponge to avoid insects entering the Pendent Mount. See the illustrations in section [4.4.2 Compact Pendent Mount](#) > Step 4.

- 4) Attach the Waterproof Rubber to the Standard/ Compact Pendent Mount.

- 5) Thread the cable(s) through the Indoor Mount Kit and join the Indoor Mount Kit to the Standard/ Compact Pendant Mount with the supplied screws and washers. Then adjust the Waterproof Rubber to the joint.
- 6) Connect the cable(s) to the Dome Camera.
- 7) Join the Dome Camera to the Indoor Mount Kit with the supplied screw and washers.

**Corner Box Mounting: Corner Thin/Wide Box + Standard/ Compact Pendant Mount + Indoor Mount Kit**



## 4.6 Pole Mount

### 4.6.1 Pole Thin/Wide Direct Mounting

**Package Contents:**

- Stainless Steel Straps x4
- M8x16 Screw x4
- Washer x4
- Spring Washer-8 x4

**Items Needed:**


- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Standard/ Compact Pendent Mount and equipped items (optional accessory)
- Pole Thin/Wide Direct Mounting (optional accessory)
- Indoor Mount Kit (optional accessory)
- Waterproof Rubber (Indoor Mount Kit's accessory)
- Stainless Steel Straps for fixing the Pole Thin/Wide Direct Mounting (optional accessory)

**Tools Needed:**

- Stainless Strap Cutter
- Tool for screwing

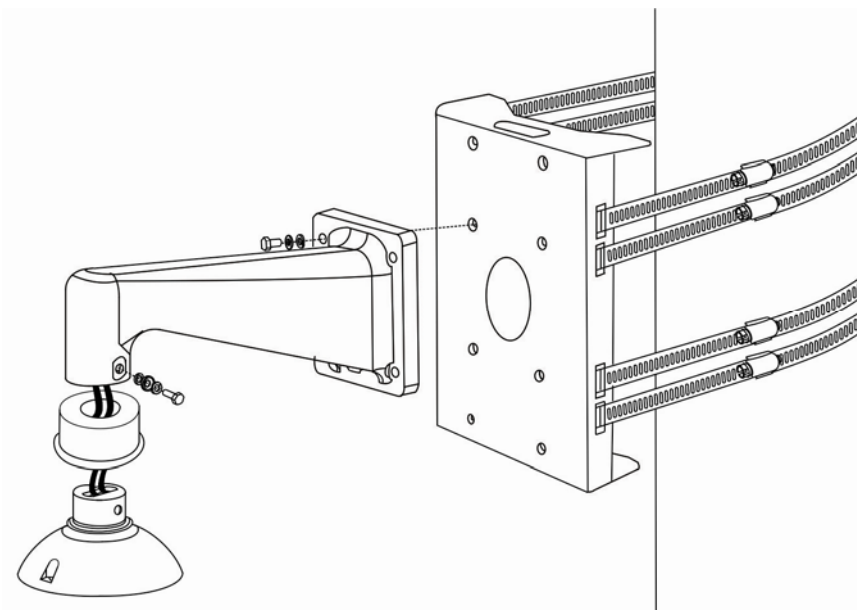
Follow the steps below to mount the Dome Camera with the Pole Thin/Wide Direct Mounting and Standard/ Compact Pendent Mount.

- 1) Fasten the Pole Thin/Wide Direct Mounting on a pole with equipped stainless straps.
- 2) Run the cable(s) through the hole on the Pole Thin/Wide Direct Mounting with the Data Cable's 22-pin cable coming out.
- 3) Fasten the Standard/ Compact Pendent Mount onto the Pole Thin/Wide Direct Mounting with the supplied screws and washers. Then thread the cable(s) through the Standard/ Compact Pendent Mount with the cable(s) coming out of the Pendent Mount's outlet.

 **NOTE:** Please block the cable entry hole with the supplied sponge to avoid insects entering the Pendant Mount. See the illustrations in section [4.4.2 Compact Pendant Mount](#) > Step 4.

- 4) Attach the Waterproof Rubber to the Standard/ Compact Pendant Mount.
- 5) Thread the cable(s) through the Indoor Mount Kit and join the Indoor Mount Kit to the Standard/ Compact Pendant Mount with the supplied screws and washers. Then adjust the Waterproof Rubber to the joint.
- 6) Connect the cable(s) to the Dome Camera.
- 7) Join the Dome Camera to the Indoor Mount Kit with the supplied screw and washers.

**Pole Direct Mounting: Pole Thin/Wide Direct Mounting + Standard/ Compact Pendant Mount + Indoor Mount Kit**



## 4.6.2 Pole Thin/Wide Box Mounting

### Package Contents:

- M8x16 Screw x4
- Washer-8 x4
- Spring Washer x4,
- Stainless Steel Straps x4

### Items Needed:

- Dome Camera
- Data Cable (supplied)
- Ethernet Cable (network Dome Camera)
- Standard/ Compact Pendent Mount and equipped items (optional accessory)
- Pole Thin/Wide Box Mounting (optional accessory)
- Indoor Mount Kit (optional accessory)
- Waterproof Rubber (Indoor Mount Kit's accessory)
- Stainless Steel Straps for fixing the Pole Thin/Wide Box Mounting (optional accessory)

### Tools Needed:

- Stainless Strap Cutter
- Tool for screwing

Follow the steps below to mount the Dome Camera with the Pole Thin/Wide Box and Standard/ Compact Pendent Mount.

- 1) Fasten the Pole Thin/Wide Box on a pole with equipped stainless straps.
- 2) Run the cable(s) through the hole on the Pole Thin/Wide Box Mounting with the Data Cable's 22-pin cable coming out.
- 3) Fasten the Standard/ Compact Pendent Mount onto the Pole Thin/Wide Box Mounting with the supplied screws and washers. Then thread the cable(s) through the Standard/ Compact Pendent Mount with the cable(s) coming out of the Pendent Mount's outlet.



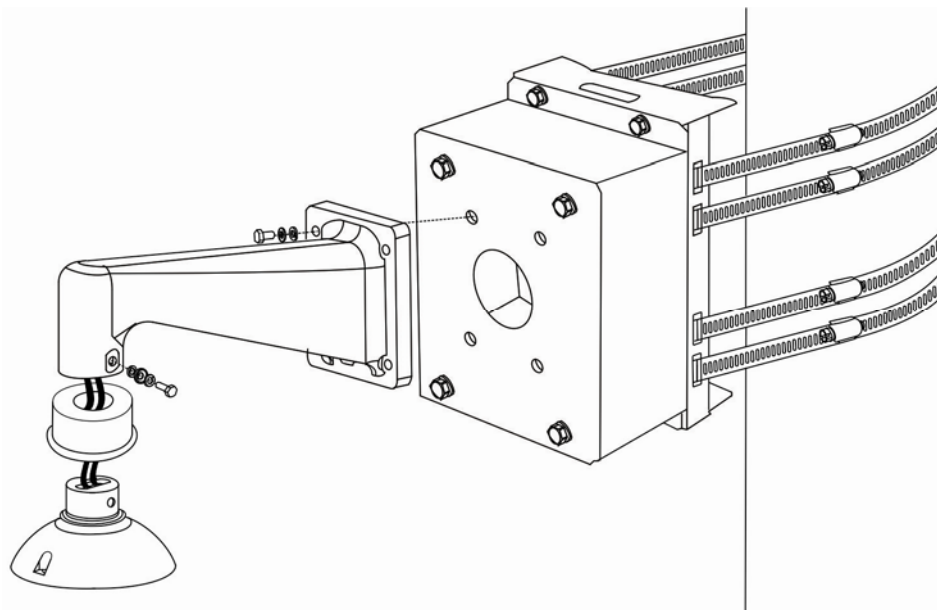
**NOTE:** Please block the cable entry hole with the supplied sponge to avoid insects entering the Pendent Mount. See the illustrations in section [4.4.2 Compact Pendent Mount](#) > Step 4.

- 4) Attach the Waterproof Rubber to the Standard/ Compact Pendent Mount.



- 5) Thread the cable(s) through the Indoor Mount Kit and join the Indoor Mount Kit to the Standard/ Compact Pendant Mount with the supplied screws and washers. Then adjust the Waterproof Rubber to the joint.
- 6) Connect the cable(s) to the Dome Camera.
- 7) Join the Dome Camera to the Indoor Mount Kit with the supplied screw and washers.

**Pole Box Mounting: Pole Thin/Wide Box + Standard/ Compact Pendant Mount + Indoor Mount Kit**



## 5. System Expansion

### 5.1 Connecting with Connector Box

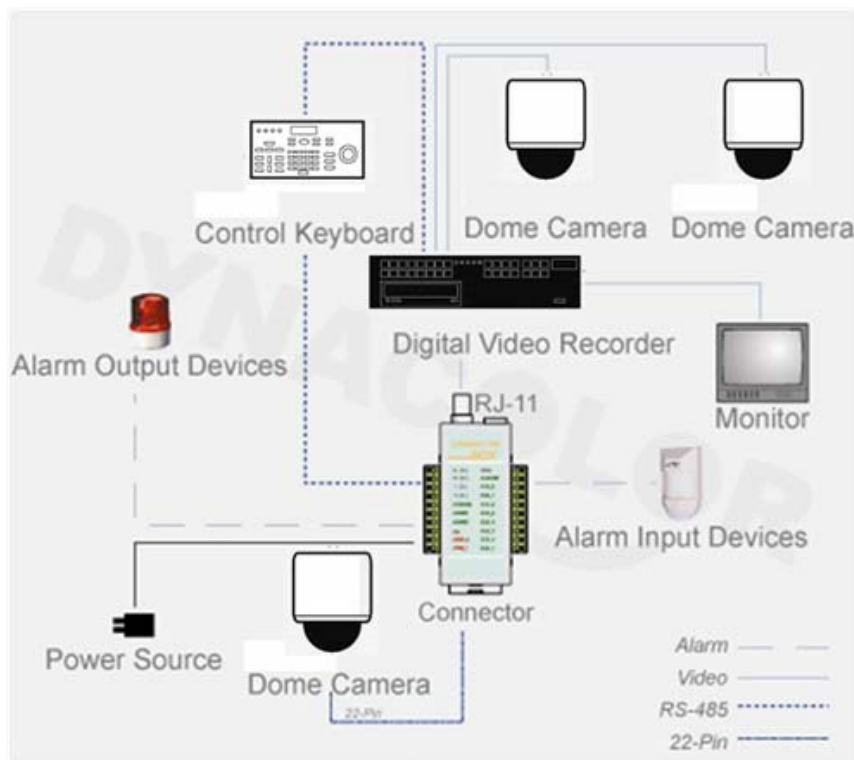
Ideally being used in indoor installation circumstances, a Connector Box provides easy wiring and well organized connection between alarms, cameras and other devices, for easy installation.

To connect the connector box with other devices:

- Use a RS-485 cable (CAT 5 is recommended) to complete RS-485 communication wiring with control devices such as DVRs and Control Keyboards.
- Use a 22 pin cable to connect the connector box to the dome.


For more detailed information, please refer to the connector box user's manual.

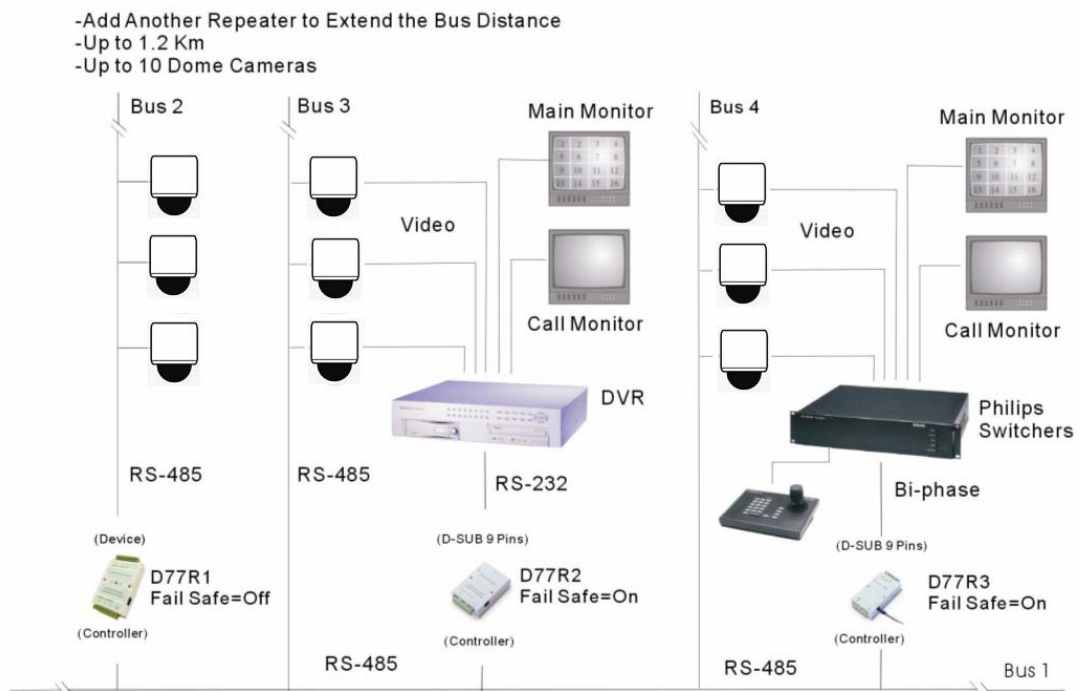
A system wired with a connector box is illustrated in the following diagram.



## 5.2 Data Formats Transforming

To integrate other surveillance devices with the High Speed Dome Cameras or to extend the distance of communications, users could employ three kinds of repeater/converter, as shown below. With the advanced circuit design, these repeaters/converters offer 1KVrms isolation voltage and surge protection capability. The exiting network can be protected by the repeaters/converters. Up to 10 devices are allowed to connect to one repeater/converter. For detailed information, please refer to the repeater/converter user's manual.

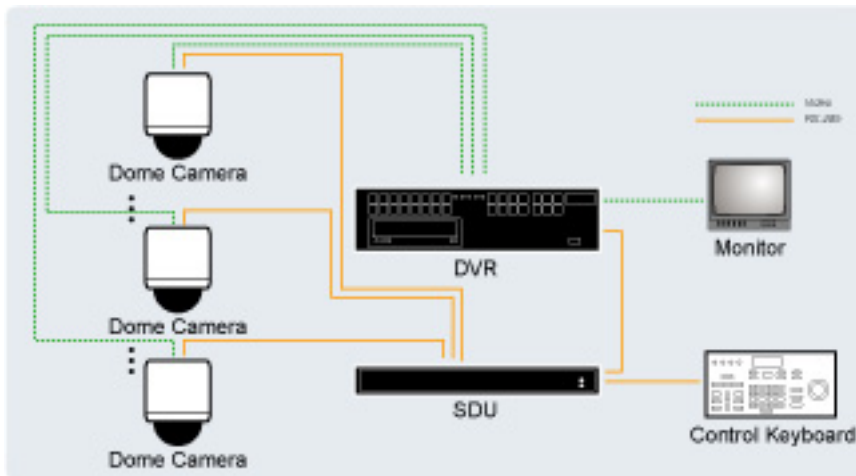
		
<p><b>D77R1</b> RS-485/RS-422 Repeater</p>	<p><b>D77R2</b> RS-232 between RS-485/RS-422</p>	<p><b>D77R3</b> Bi-Phase to RS-485/RS-422</p>



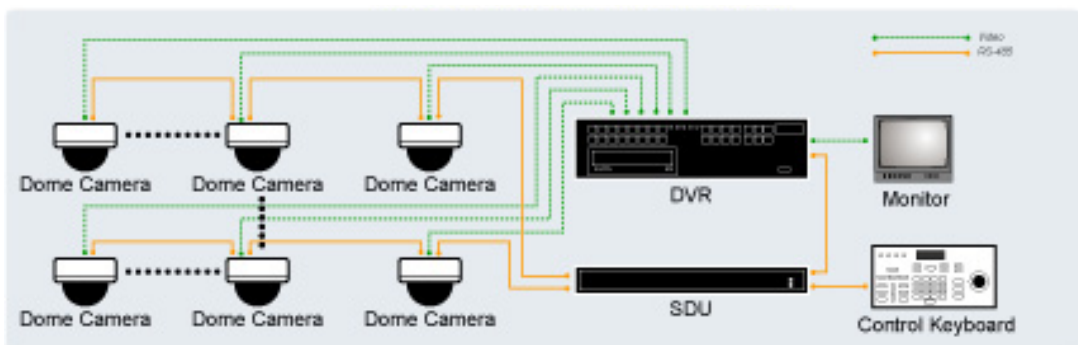
## 5.3 Signal Distribution Unit

The RS-485 Signal Distribution Unit (SDU) is designed to relay control codes to Speed Dome Cameras. It is capable of communicating with cameras up to 1.0 kilometers away. Additionally, the SDU can be installed in either “star” or “daisy chain” configuration with up to 160 cameras (see the diagrams below). Its versatile installation configuration makes an easy integration into expanding surveillance systems. For more information, please refer to the SDU user’s manual.

### Star Configuration



### Daisy Chain Configuration



## 6. System Integration

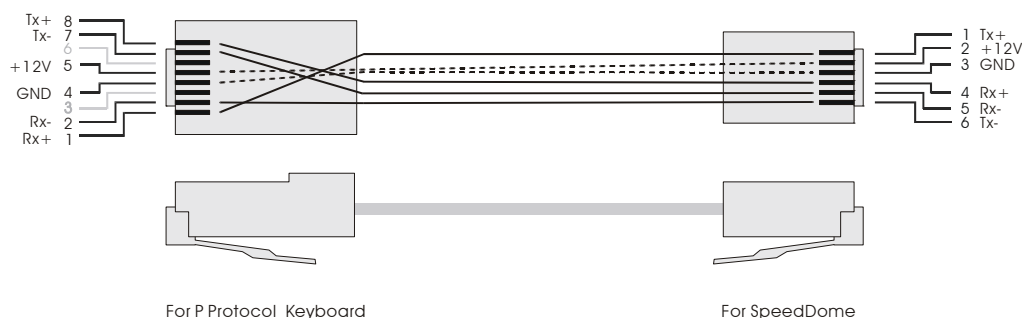
The Dome Camera is allowed to be integrated into other suppliers' surveillance systems with large set of built-in protocols. Refer to the following sections for more information.

### 6.1 Using Pelco Keyboard

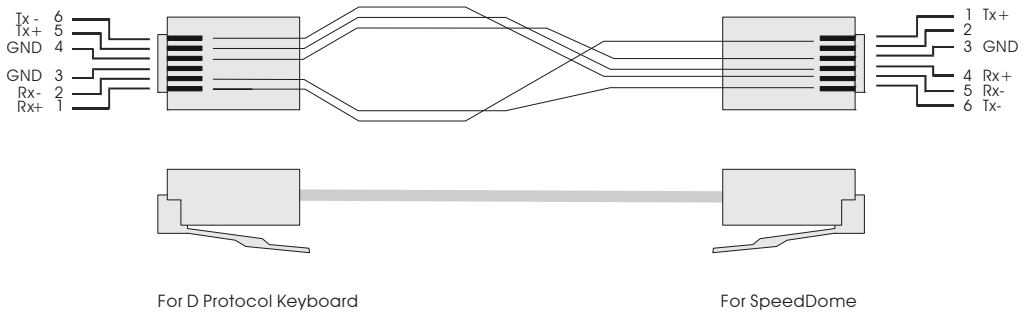
The Speed Dome Camera can be controlled through a Pelco keyboard which built in with D protocol and P protocol. Please follow the instruction to manipulate our speed dome by a keyboard with D and P protocols.

Function	Instruction
<b>Set Preset</b>	Number key + press and hold <Preset > button for three seonds.
<b>Go Preset</b>	Number key + <Preset> to command a Dome Camera to go to a specific preset position.
<b>Display or hide an OSD menu</b>	7 7 <Preset>
<b>Move the cursor in OSD menu</b>	Move the cursor up/down/right/left by pushing the joystick up/down/right/left respectively
<b>&lt;ENTER&gt;</b>	7 7 <Preset>
<b>Reset the Dome Camera</b>	7 8 <Preset>

#### Cable Definition (P Protocol Keyboard to PTZ Camera)



### Cable Definition (D Protocol Keyboard to PTZ Camera)



## 6.2 Using Philips Allegiant Keyboard

The Dome Cameras can be integrated into Philips Allegiant systems through D77R3 repeaters. Please follow the instructions to control Dome Cameras through Philips Allegiant systems.

### Symbol Definition

<shot>	Command Dome Cameras to go to specific preset position.
<set>	Set preset position.

### Special Function

7 6 <set>	Exit OSD menu directly.
7 7 <set>	1. Display or hide OSD menu. 2. Virtual key to send an ENTER command when OSD is displayed.
7 8 <set>	Reset doma camera.
<Iris Open>	Send an ENTER command when OSD is displayed.

### Control Dome Camera Using Allegiant Keyboard

- User can move the cursor left/right/up/down through pushing joystick left /right/up/down.
- Some differences for ENTER command.  
User cannot send ENTER command directly. User can send a ENTER command through “ 7 7 <Set> “.