

CyberDome II  
**Installation Manual**



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## Preface

This is the GE *CyberDome II Installation Manual*. This document includes an overview of the product and detailed instructions explaining:

- how to install the housing; and
- how to attach the pan/tilt/zoom (PTZ) camera assembly.

There is also information describing how to contact technical support if you have questions or concerns.

To use this document effectively, you should have the following minimum qualifications:

- a basic knowledge of CCTV systems and components; and
- a basic knowledge of electrical wiring and low-voltage electrical connections.

Read these instructions and all ancillary documentation entirely before installing or operating this product. The most current versions of this and related documentation may be found on our website. Refer to [Online resources](#) on page 38 for instructions on accessing our online publication library.

**Note:** A qualified service person, complying with all applicable codes, should perform all required hardware installation.

## Conventions used in this document

The following conventions are used in this document:

<b>Bold</b>	Menu items and buttons.
<i>Italic</i>	Emphasis of an instruction or point; special terms.
	File names, path names, windows, panes, tabs, fields, variables, and other GUI elements.
	Titles of books and various documents.
<i>Blue italic</i>	(Electronic version.) Hyperlinks to cross-references, related topics, and URL addresses.
Monospace	Text that displays on the computer screen.
	Programming or coding sequences.

## Safety terms and symbols

These terms may appear in this manual:



**CAUTION:** *Cautions* identify conditions or practices that may result in damage to the equipment or other property.



**WARNING:** *Warnings* identify conditions or practices that could result in equipment damage or serious personal injury.





# Chapter 1 Introduction

This chapter provides an overview of your CyberDome II dome system, including product contents and system requirements.

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## Product overview

CyberDome II™ is a line of advanced pan/tilt/zoom (PTZ) cameras. In addition to powerful cameras, CyberDome II features a graphical programming interface for easier customization of camera settings, and passcodes for protection against unauthorized access.

The CyberDome II supports many protocols to work with various keypad controllers, digital video recorders, and other video surveillance equipment. (See [Setting the protocol](#) on page 27 for a list of supported protocols.)

Installation of the CyberDome II line of domes is simplified because all power, data, video, and alarm connections are provided in the housing. Configuration parameters such as presets and tours unique to each installation site are stored in the housing memory. This allows you to replace cameras or move them between housings without having to reprogram them for each new site. As you install the first dome, you will find many other enhancements that make installation easier and quicker.

The general steps for installing your dome include:

- preparing the mounting surface and installing the mount (if used) and housing;
- preparing the cables and wiring the housing;
- addressing the camera site, setting the protocol, and setting the termination;
- installing the PTZ camera assembly; and
- installing the dome.

Be aware that the power requirements for CyberDome and CyberDome II are different. See [Power requirements](#) on page 5 and [Cable management](#) on page 5.

## Product contents

The CyberDome II consists of the following:

- Housing.
- Package containing three connectors (one 2-pin for power; one 6-pin for UTP, auxiliary data, and RS-485; one 14-pin for alarms and contacts) and a small screwdriver. (The Select version of CyberDome II has two connectors: a 2-pin connector for power and a 2-pin connector for RS-485 data.)
- PTZ camera assembly.
- Dome (mirror domes are shipped with cotton gloves for special handling).
- Mount (wall-mount and flush-mount versions only).
- Installation and user manuals.

You may receive the package contents in one large carton containing three boxes (four with wall-mount versions), or if shipped individually, you may receive three (or four) separate boxes. One box will contain the housing, connectors, and manuals. The PTZ assembly, dome, and mount (for wall-mount versions) are each shipped in separate boxes.

Inspect the packages and contents for visible damage. If any components are damaged or missing, do not use the unit; contact the supplier immediately. If you need to return the unit, you must ship it in the original box.

## System requirements

For proper operation, adhere to the following operational, load, cable, and power requirements for CyberDome II domes.

### Operational requirements

CyberDome II contains a built-in receiver that decodes commands originating from a compatible controlling device, such as a keypad or ASCII control software. A minimum of one controlling device is required for operation, as shown in *Figure 1*. In this typical DVR system, an operator can pan, tilt, and zoom the camera, find presets, and start preset and ShadowTours from the keypad.

Figure 1. Typical DVR system

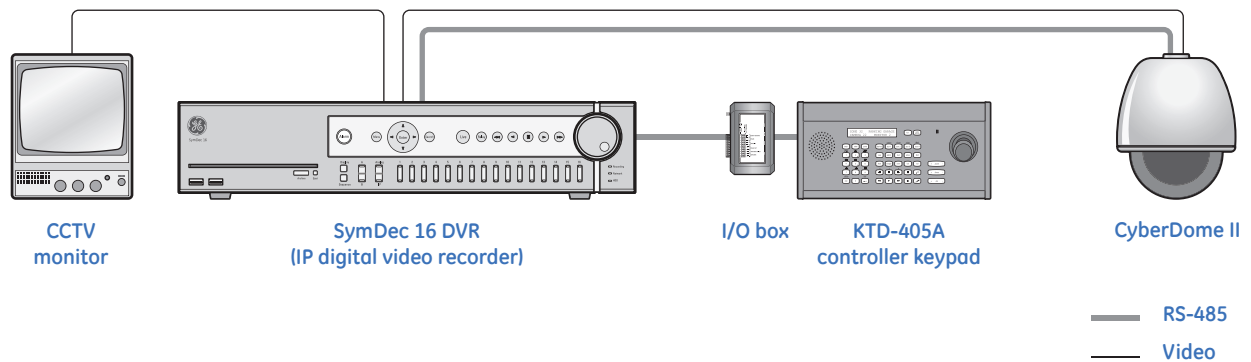


Figure 2 shows a typical network system, and Figure 3 on page 4 shows an enhanced system.

Figure 2. Typical IP system

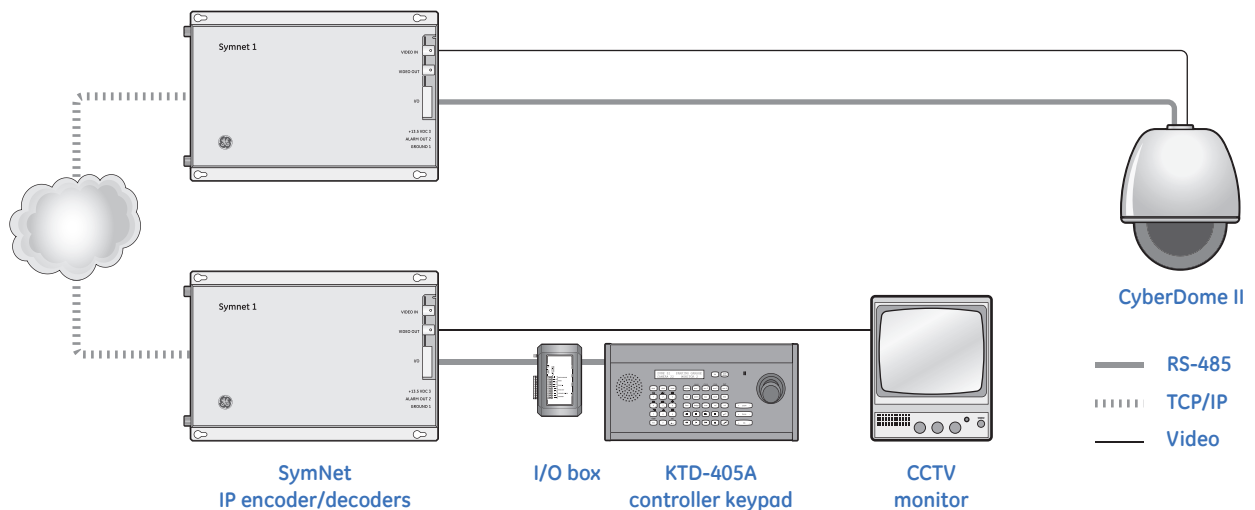
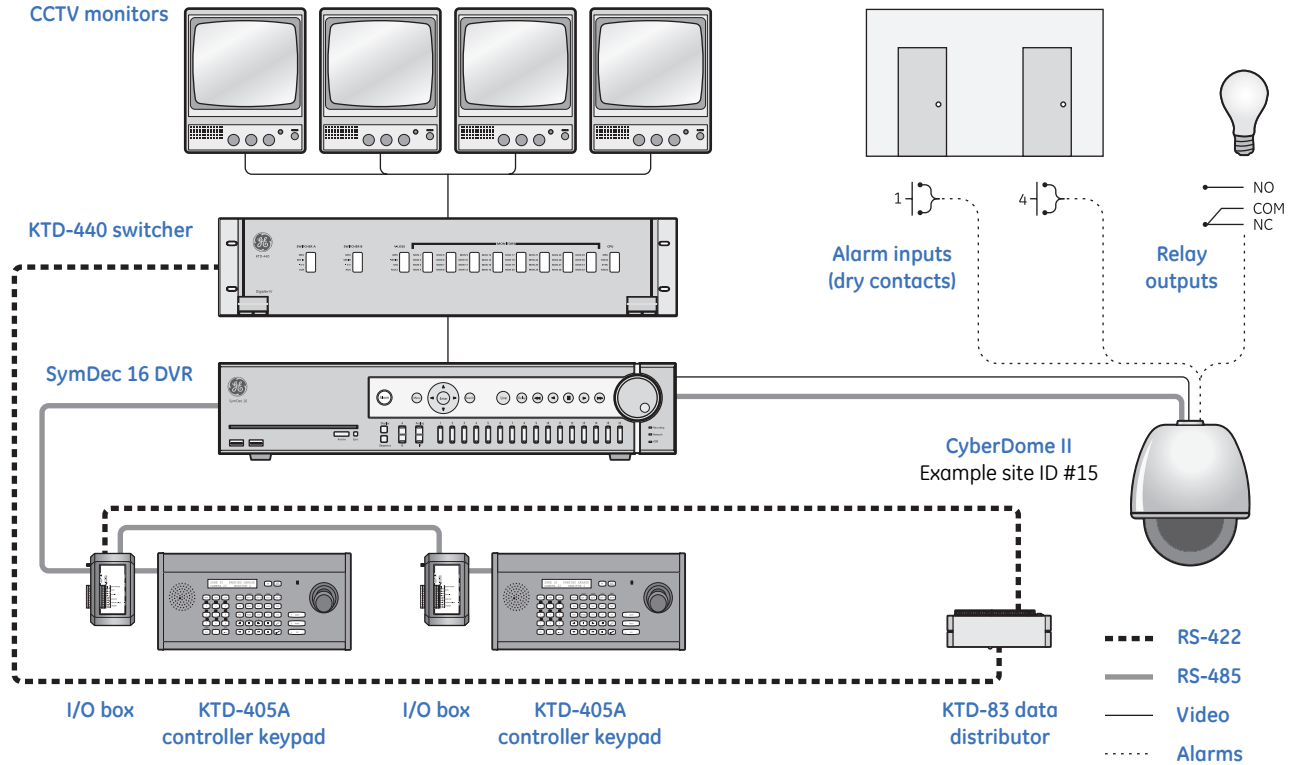


Figure 3. Typical enhanced system



## Minimum load requirements

Table 1 lists the load requirements for all CyberDome II dome configurations.

Table 1. Minimum load requirements of dome configurations

Dome configuration	Minimum load
Rugged, cast aluminum pendant-mount housing (with any mount)	100 lb.
Heavy-duty housing (with any mount)	
Swing-arm mount (with any dome except heavy duty or flush-mount)	
All other dome and mount configurations	50 lb.



**CAUTION:** For safety, the mounting surface, hardware, and procedure used for securing the dome must support the weight of the dome, mount (if used), cables, and any structural or environmental vibration according to local codes.

## Power requirements

Every CyberDome II dome requires a 24 VAC power supply to operate the PTZ, camera, and heater/fan, if present. The startup and running power requirements vary depending on the model (*Table 2*).

Table 2. Power requirements at 24 VAC ( $\pm 4$  VAC) operating voltage

Model	Startup power	Running power	Minimum power source to use
Dome with fan	25 VA	20 VA	40 VA
Dome with 12 W heater/fan ( $\times 2$ )	93 VA	45 VA	56 VA
Rugged and HD dome with 23 W heater/fan ( $\times 2$ )	153 VA	66 VA	100 VA



**CAUTION:** Use only a Class 2 power supply of the required output rating as listed on individual units and specified.

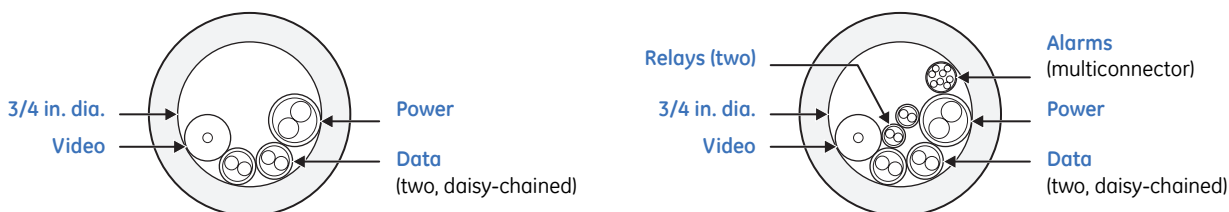
## Cable management

Follow all local codes for cable management. As a general rule, you can fill a cable conduit to a maximum of 60% of its capacity. You must maintain 40% free space. A variety of factors will determine how many cables you can run into the dome. Capacity limitations include:

- number of cables
- size of the cables
- use of single-conductor or multiple-conductor cable
- use of a junction box

Figure 4 provides an illustration of the cable capacity of three typical applications. *It is important to note that all cables of the same gauge are not of the same diameter.* Manufacturer, shielding, and rating affect the actual diameter of cables of the same gauge. GE leaves the selection of the appropriate cable to the discretion of the installer who is working with the local codes of the installation site.

Figure 4. Three acceptable typical cabling scenarios



Percentage conduit fill = 38%, includes:

- Video: one 59U/6U coaxial (0.24 in. dia)
- Data: two 20 AWG UTP (0.19 in. dia)
- Power: one 16 AWG UTP (0.25 in. dia)

Percentage conduit fill = 53%, includes:

- Video: one 59U/6U coaxial (0.24 in. dia)
- Data: two 20 AWG UTP (0.19 in. dia)
- Power: one 16 AWG UTP (0.25 in. dia)
- Alarms: 24 AWG UTP (0.11 in. dia.)
- Relays: 24 AWG UTP (0.11 in. dia.)

## Cable requirements

Table 3 lists the requirements for the cables that connect to the dome.

Table 3. Cable requirements

Operation	Cable requirement	Length	
		feet	meters
Data	For <b>RS-422</b> : 22 gauge (0.64 mm) <i>unshielded</i> , two-conductor, twisted-pair (UTP) cable	10,000	3,000
	For <b>RS-485</b> : 22 gauge (0.64 mm) <i>shielded</i> , two-conductor, twisted-pair (STP) cable	3,000	900
Video	75 ohm coaxial cable (RG59 with lift/gain)	1,600	486
	22 gauge (0.64 mm) unshielded, two-conductor, twisted-pair (UTP) cable	1,250	381
	<b>Note:</b> Use only crimp-on BNC connectors. Do not use screw-on connectors.		
Alarm	Cat-5 cable (recommended)	1,250	381
Relay contacts	Cat-5 cable (recommended). Contacts rated for 60 W DC, 62.5 W AC with 2 A max.	1,250	381
Power	24 VAC cable. To determine the size of cable needed for individual applications, see <a href="#">Power cable size and length requirements</a> .		

**Note:** When using UTP cable for video and data, the wires can share the same jacket but must remain separate twisted pairs.

## Power cable size and length requirements

Using the proper gauge of power cable will ensure proper operation and avoid voltage drops. See Table 4 for the recommended cable gauge for varying maximum cable lengths and power draws.

Table 4. Recommended power cable gauges based on maximum lengths for an operating voltage of 24 VAC (±4 VAC)

Wire gauge		Domes with fan (20 VA)		Domes with 12 W heater/fan (x2) (45 VA)		HD domes with 23 W heater/fan (x2) (66 VA)	
AWG	mm (dia.)	feet	meters	feet	meters	feet	meters
10	2.60	1569	478	784	238	490	149
12	2.05	988	301	494	150	309	94
14	1.62	620	188	310	94	194	59
16	1.29	391	119	196	59	122	37
18	1.02	246	74	123	37	77	23



**WARNING:** Be aware that the power requirements for CyberDome II and CyberDome are different, which may require new cabling when replacing CyberDomes with CyberDome II domes.

## Chapter 2 Housings and cables

This chapter provides instructions for installing housings and cables.

In this chapter:

<i>Backward compatibility with CyberDome I housings</i> .....	8
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## Backward compatibility with CyberDome I housings

The CyberDome II PTZ is compatible with CyberDome I housings, but there are some exceptions. Although the onscreen display (OSD) interface, including menus, will show the CyberDome II design, not all of the CyberDome II features are supported on CyberDome I housings. The following features are not available:

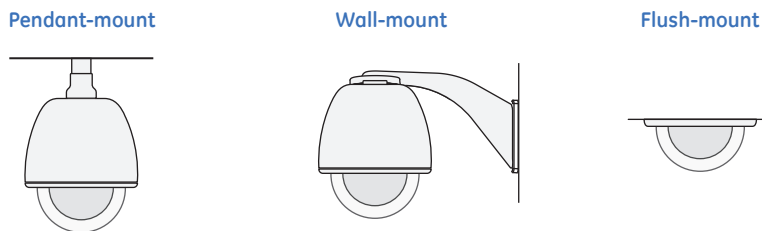
- Site-tied memory
- Internal alarms
- Internal relays
- Internal wiring terminal blocks
- Advanced heater and fan system
- Lift and gain functionality.
- Up-the-coax (UTC) protocol support

Also, if you install a CyberDome II PTZ in an older CyberDome I housing, you must install a fan assembly on the tilt arm of the PTZ. (See *Fan installation* on page 16 for instructions.) You may use the fan from your CyberDome I PTZ, or call Customer Service (see *Contacting us* on page 38) to order a new one (part number 10556789A).

## Various mounting and housing styles

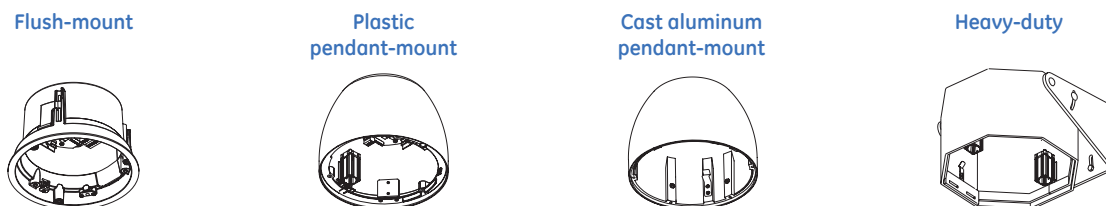
There are three basic mounting styles: pendant, wall, and flush. A pendant-mount lowers a dome from a ceiling, a wall-mount extends a dome from a wall, and a flush-mount raises a dome's dome even with a ceiling. See *Figure 5*. This document provides the instructions for all mounting styles.

Figure 5. Basic mounting styles



There are four basic housing styles: flush-mount, plastic pendant-mount, cast aluminum pendant-mount, and heavy-duty (*Figure 6*). Installation is generally the same for all housing styles. There are some differences, such as how the dome rings attach to the housings (*Figure 27* on page 33). Where differences exist, the instructions will specify.

Figure 6. Basic housing styles





## Wiring best practices

To ensure the wires are connected properly and not at risk of being cut or frayed, follow these guidelines.

### Pendant-mount wire routing

Cables run down through the cable entry hole and the dust seal. Take care to avoid damaging the dust seal during installation.

**Note:** Keep service loops out of housing area when possible.

Figure 7. Side view of pendant-mount cabling and typical wall-mount

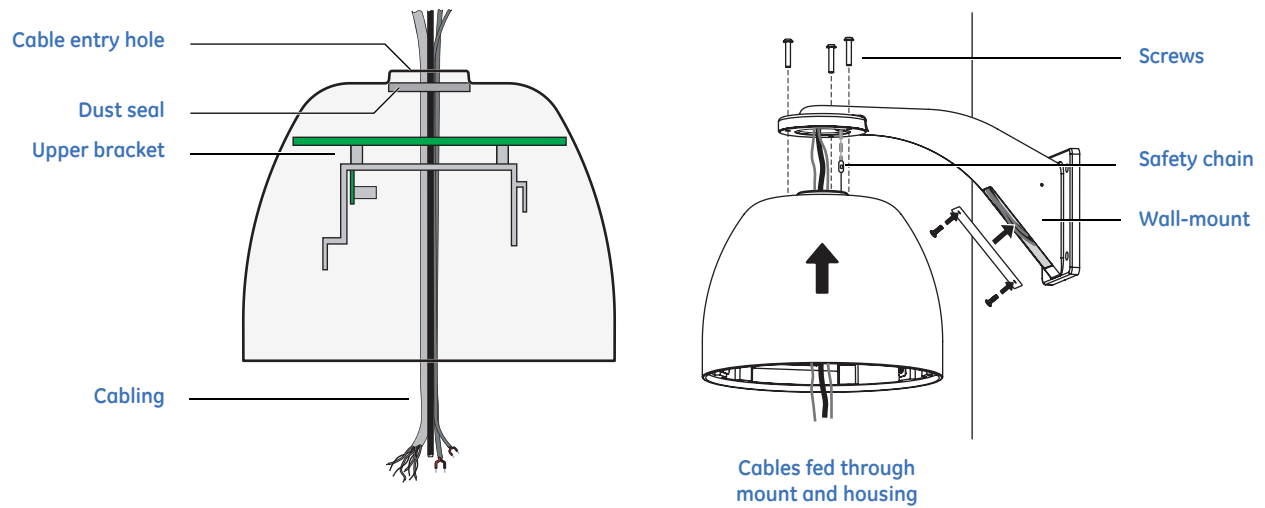
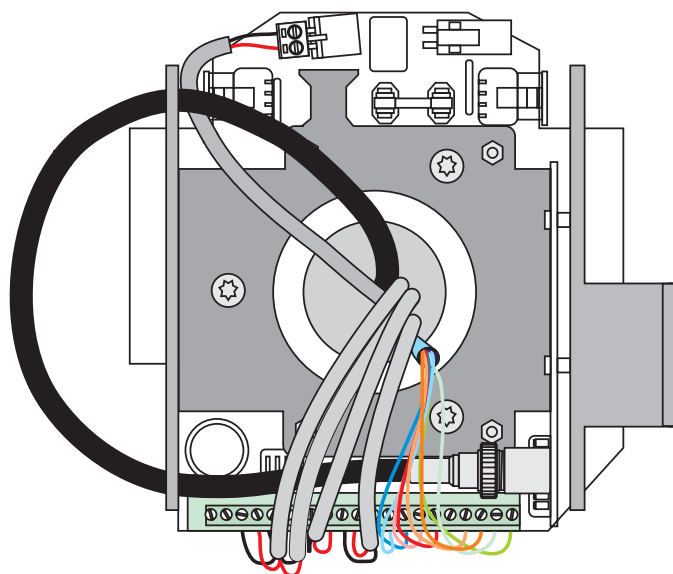


Figure 8. Top view of pendant-mount cabling



## Flush-mount wire routing

Cables are fed through the cable entry hole in the side (or top) of the housing. Route the wires through the top or side of the housing and around the camera bracket.

**Note:** Keep service loops out of housing area when possible.

Figure 9. Side view of flush-mount cabling

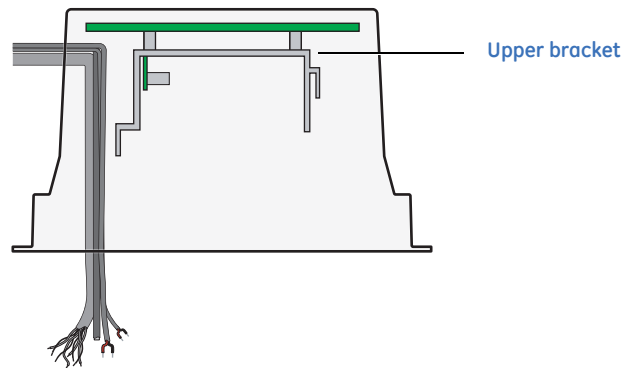
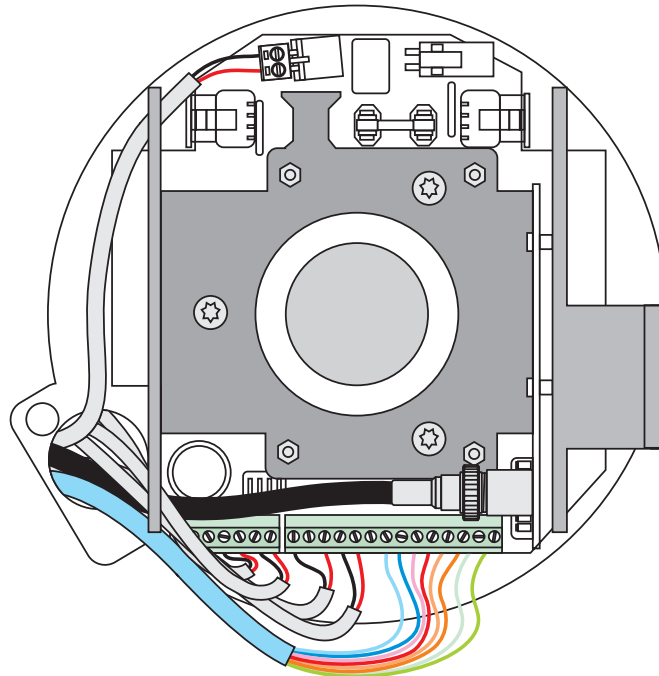


Figure 10. Top view of flush-mount cabling



## Pendant-mount housings

Pendant-mount and flush-mount housings require different preparation of the mounting surface and different installation procedures of the housings. Follow the instructions given here for pendant-mount housings.

Pendant-mount housings can be mounted to a pipe to lower them from a ceiling or to a wall-mount arm to extend them from a wall. Instructions are provided in this document for both mounting methods.

### Preparing the surface for pendant-mounts

Following are the steps for preparing the mounting surface if you are mounting the housing to a pipe. If you are mounting the housing to the GEA-102 wall-mount arm, instructions for installing the GEA-102 are available in this manual ([Installing the wall-mount arm](#) on page 40). If you are installing one of the other mounts, refer to the instructions that came with the mount.



**CAUTION:** For all installations, heed these cautions:

- Complete all installation steps before supplying power to the dome.
  - To ensure proper operation of a PTZ unit, install the mount level.
  - For safety, the mounting surface, hardware, and procedure used for securing the dome must support the weight of the dome, mount (if used), cables, and any structural or environmental vibration according to local codes. See [Table 1](#) on page 4.
- 

To prepare the mounting surface:

1. Following all local codes, install the pipe.
2. Make sure that the facility cables (data, video, and power) for the dome comply with the recommendations provided in [Cable requirements](#) on page 6.
3. Feed the facility cables through the pipe in the mounting surface.
  - Pull enough cable to make connections. You can always pull back unneeded length later.
  - How many cables you have depends upon how many video, data, and power cables. See [Wiring](#) on page 19.

### Installing the housing

With the pipe or mount now installed, install the housing.

If you are installing the housing outdoors and onto a pipe, you must install the rubber water-sealing boot that provides an additional layer of water protection. Applying PTFE thread sealing tape (for example, Teflon<sup>®</sup> tape) to the pipe is required as a first layer of protection.



**CAUTION:** Avoid getting rain or moisture in the housing so that the electronic components on the PCBs are not damaged.

---

To install the housing to a pipe or mount, see [Figure 11](#) on page 12 and do the following:

1. If you are installing the housing outdoors and onto a pipe:

- a. Spray the pipe with soapy water.
  - b. For outdoor applications, slide the rubber boot onto the pipe, above the threads.
  - c. Wrap the pipe threads with the supplied PTFE thread sealing tape in the direction that the dome will screw onto the pipe. Overlap the tape and cover the threads.
2. Hold the housing up near the pipe or mount. If you installed the GEA-102 wall-mount arm, make sure that the safety chain is securely attached (*GEA-102 wall-mount arm* on page 40).
  3. Feed the facility cables through the dust seal in the top of the housing. Allow enough cable length to make connections. *Figure 8* on page 9 shows how the cables run through the housing.

---

**CAUTION:** For safety, the mounting surface, hardware, and procedure used for securing the dome must support the weight of the dome, mount (if used), cables, and any structural or environmental vibration according to local codes. See *Table 1* on page 4.

---

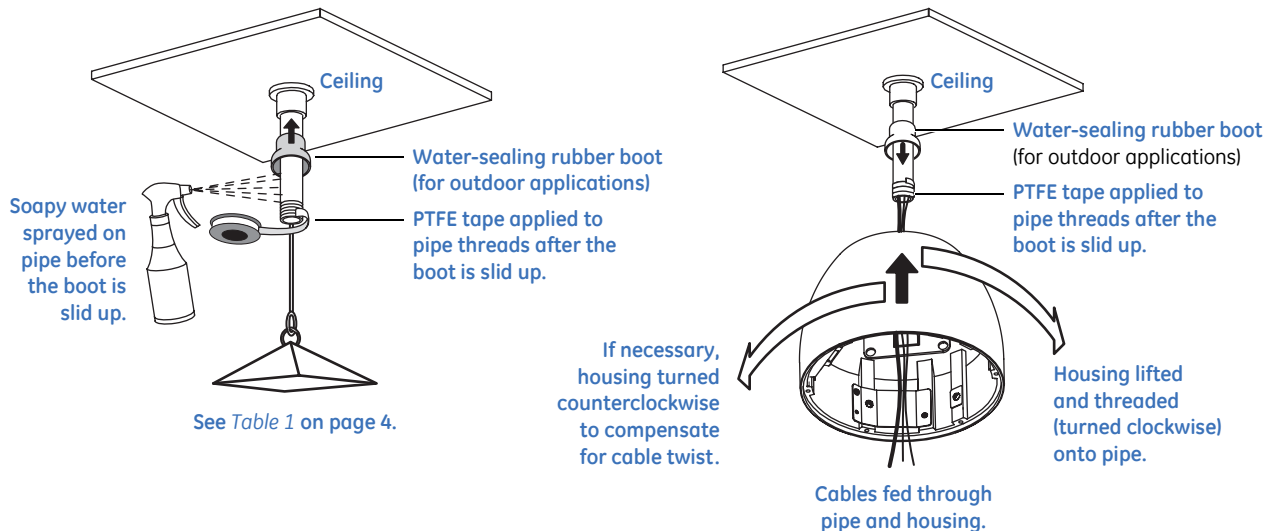
4. Attach the housing to the pipe or mount. Slide the rubber boot down the pipe and fit it securely over the housing's flange.
  - For pipe installations, thread the housing onto the pipe. If necessary, first turn the housing counterclockwise to compensate for the cable twisting.

**Note:** Do not overtighten the plastic housing on the pipe mounting or the housing will crack and leak.

- For wall-mount installations, use the fasteners that were provided with the mount.

---

Figure 11. Installing the pendant-mount housing



## Flush-mount housings

Flush-mount and pendant-mount housings require different preparation of the mounting surface and different installation procedures of the housings. Follow the instructions given here for flush-mount housings.



**CAUTION:** The flush-mount housing is for indoor applications only. Do not expose it to moisture, or the unit may become damaged.

### Preparing the surface for flush-mounts

Following are the steps for preparing the mounting surface if you are mounting the housing directly into a solid surface that does not require reinforcement. If the mounting surface does require reinforcement, first install a GEA-113 T-bar ceiling panel or a GEA-114 T-bar support kit. Instructions for installing the GEA-114 are available in this manual (*GEA-114 T-bar ceiling support kit* on page 45). If you are installing a GEA-113, refer to the instructions that came with the panel (1052914).



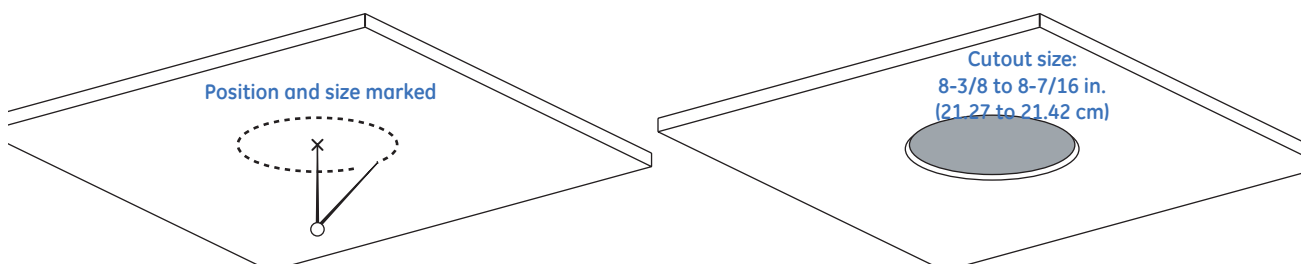
**CAUTION:** For all installations, heed these cautions:

- Complete all installation steps before supplying power to the dome.
- To ensure proper operation of a PTZ unit, install the mount level.
- For safety, the mounting surface, hardware, and procedure used for securing the dome must support the weight of the dome, mount (if used), cables, and any structural or environmental vibration according to local codes. See *Table 1* on page 4.

To prepare the mounting surface, see *Figure 12* and do the following:

1. Mark the position and size of the housing passthrough hole on the mounting surface. The size of the cutout for the passthrough must be 8-3/8 to 8-7/16 in. (21.27 to 21.42 cm).
2. Following all local codes, cut the housing passthrough hole.
3. Make sure that the facility cables (data, video, and power) for the dome comply with the recommendations provided in *Power requirements* on page 5.
4. Feed the facility cables through the housing passthrough hole in the mounting surface.
  - Pull enough cable to make connections. You can always cut off unneeded length later.
  - How many cables you have depends upon how many video, data, and power cables you are using. See *Wiring* on page 19.

Figure 12. Preparing the mounting surface for flush-mount housings being mounted into solid surfaces not requiring reinforcement



## Installing the housing

With the surface prepared and/or the mount now installed, install the housing.



**CAUTION:** All flush-mount installations must have a fan. If you are installing a flush-mount housing that does not have a fan, see [Fan installation](#) on page 16.

---

To install a flush-mount housing, see *Figure 13* on page 15 and do the following:

1. Remove either conduit knockout (side or top) in the housing.
2. Hold the housing up near the housing passthrough of the mount or cutout.
3. Connect a steel safety cable, if required by local codes.
  - a. Obtain a steel safety cable of 0.125 in. (3 mm) maximum diameter that complies with local codes.
  - b. Snip off the nipple that opens access to the safety cable clip.
  - c. Feed your safety cable through the exposed hole.
  - d. Secure one end of the safety cable into the safety clip surrounding the exposed hole inside the housing.
  - e. Secure the other end of the safety cable to the building superstructure.
4. Feed the facility cables through the conduit hole of the housing. Allow enough cable length to make connections. *Figure 9* on page 10 shows how the cables run through the housing.

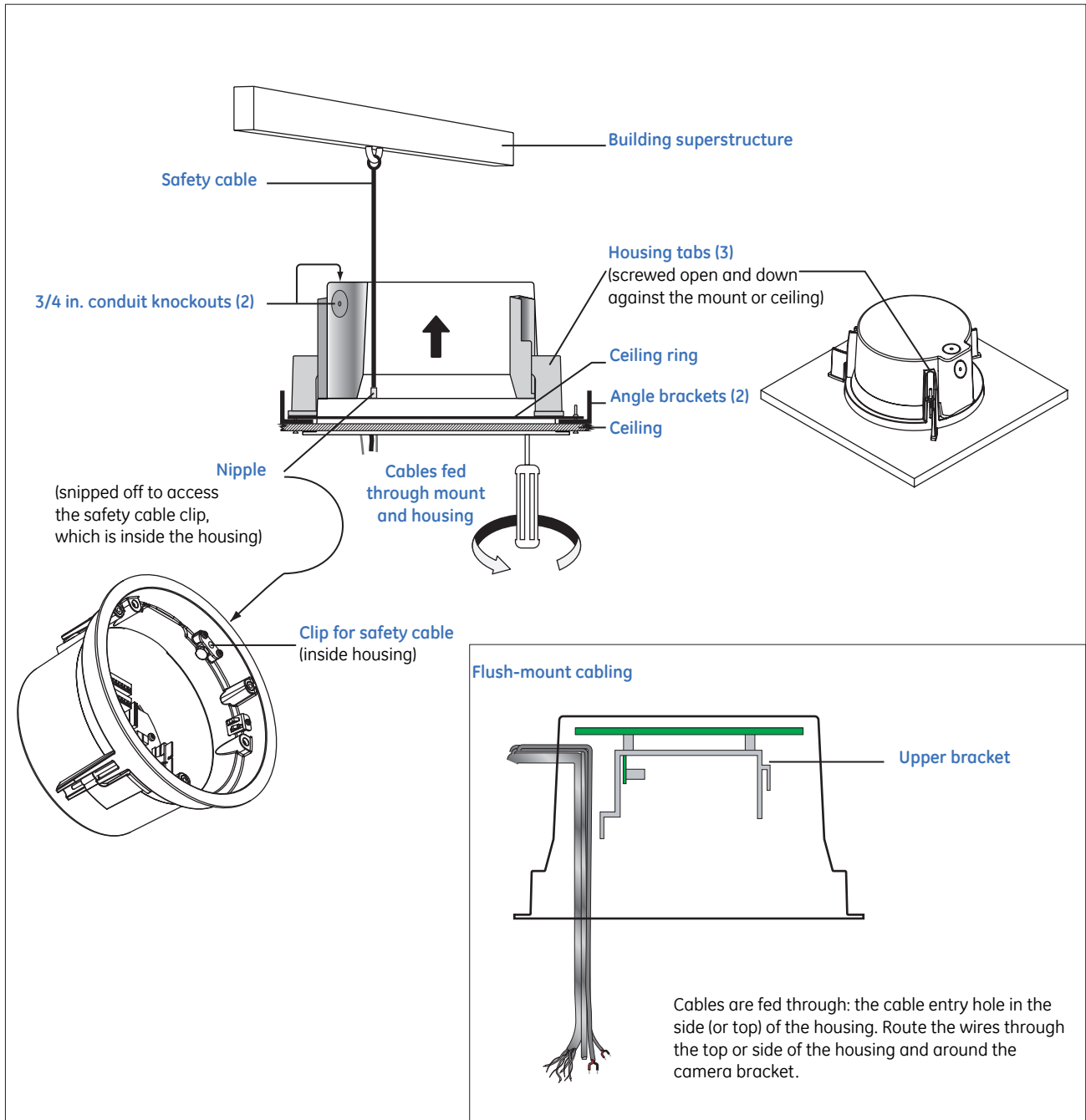


**CAUTION:** For safety, the mounting surface, hardware, and procedure used for securing the dome must support the weight of the dome, mount (if used), cables, and any structural or environmental vibration according to local codes. See *Table 1* on page 4.

---

5. Attach the housing to the mount or ceiling by screwing the housing tabs open and down.

Figure 13. Installing the flush-mount housing



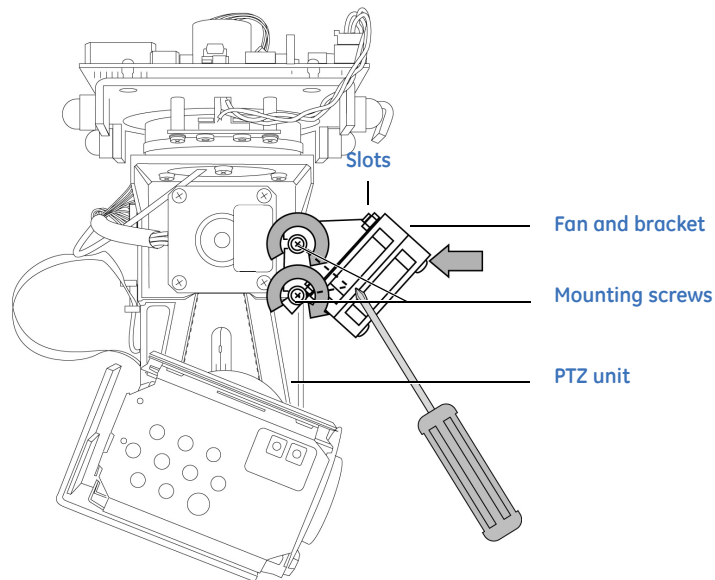
## Fan installation

CyberDome II flush-mount housing kits come with a fan assembly, which you will need to install on the tilt arm of the PTZ unit. If you are retrofitting an existing CyberDome I flush-mount housing with a CyberDome II PTZ unit, you will also need to install a fan. You may use the fan from your CyberDome I PTZ, or call Customer Service (see [Contacting us](#) on page 38) to order a new one (part number 10556789A).

To install a fan on the PTZ unit, do the following:

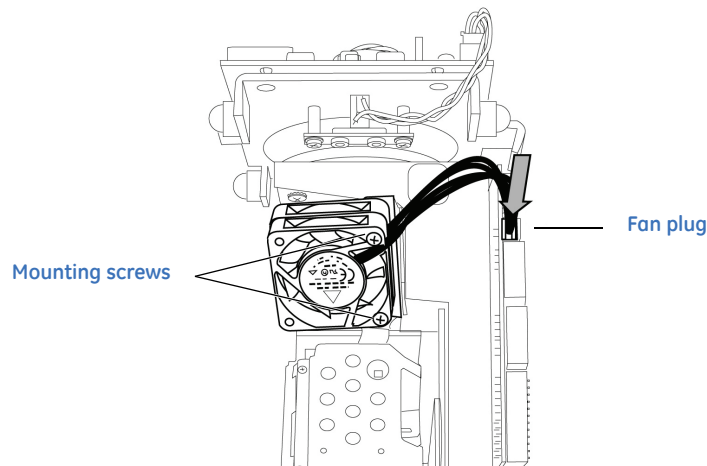
1. Slide the slots on the fan bracket onto the mounting screws on the PTZ unit (*Figure 14*).

Figure 14. Installing the new fan on the PTZ unit



2. Tighten the mounting screws (clockwise) to secure the fan and bracket to the PTZ unit.
3. Connect the fan plug to the fan connector on the PTZ unit. (*Figure 15*).

Figure 15. Connecting the new fan cable



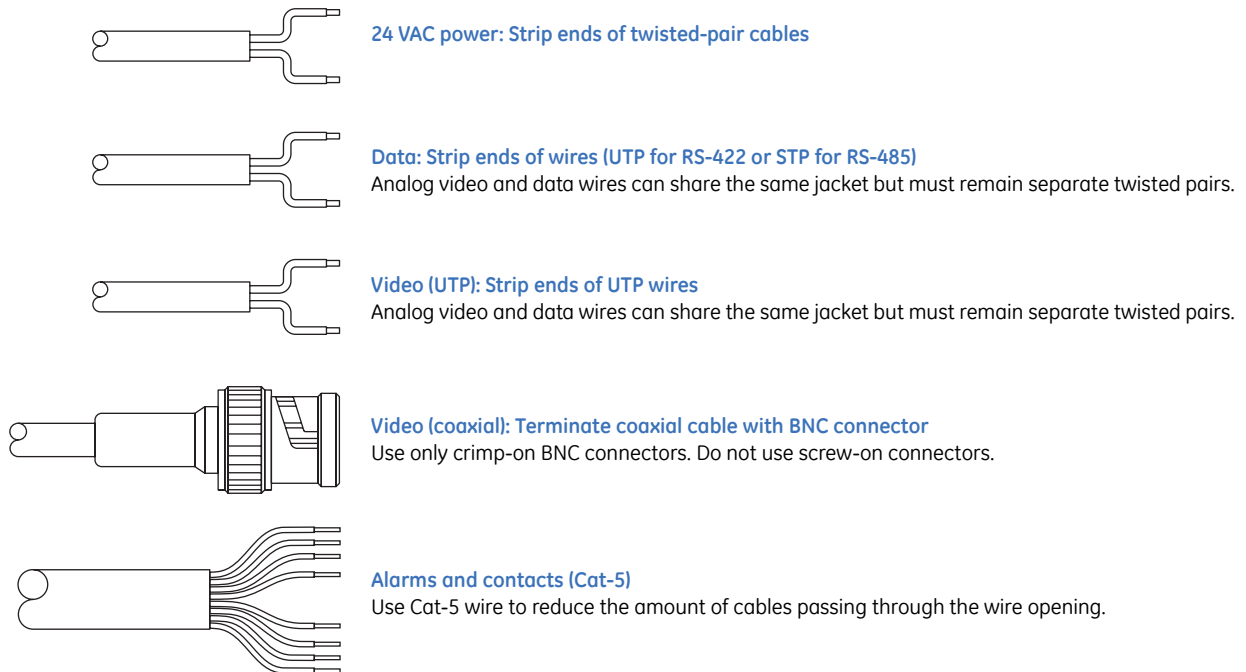


## Preparing the cables

Your environment's video cabling (coaxial or UTP) and the number of video, data, and power cables you will be using will dictate the types and quantities of cables you need to prepare.

To prepare the facility camera cables, terminate the cable ends as shown in *Figure 16*. Allow approximately 3 in. (76 mm) of cable for making connections.

Figure 16. Prepared cables



When using UTP video, the UTP video and RS-422 or RS-485 control cables can share the same wire jacket, but must remain as separate twisted-pairs.



**CAUTION:** Do not connect the 24 VAC power cable to the video or RS-422 or RS-485 connection or you will damage the PressurDome. Do not supply power to the unit until you have completed the installation steps.



# Chapter 3 Wiring

This chapter explains how to wire the dome. One of the two boards that you will be handling while you wire the dome is inside of the housing.

In this chapter:

<i>Components used for basic and advanced operation</i> .....	20
<i>Wiring the housing board</i> .....	22
<i>Setting the termination</i> .....	24

## Components used for basic and advanced operation

Connect data, video, and power cables to the components in the dome for basic operation (*Figure 17*). How many cables you will feed into the housing depends upon how many video, data, and power cables you will be using. For pipe capacity, see *Power cable size and length requirements* on page 6.

The dome uses RS-485 or RS-422 for data communication. See *Cable requirements* on page 6 for more information on limitations.

Figure 17. Housing board

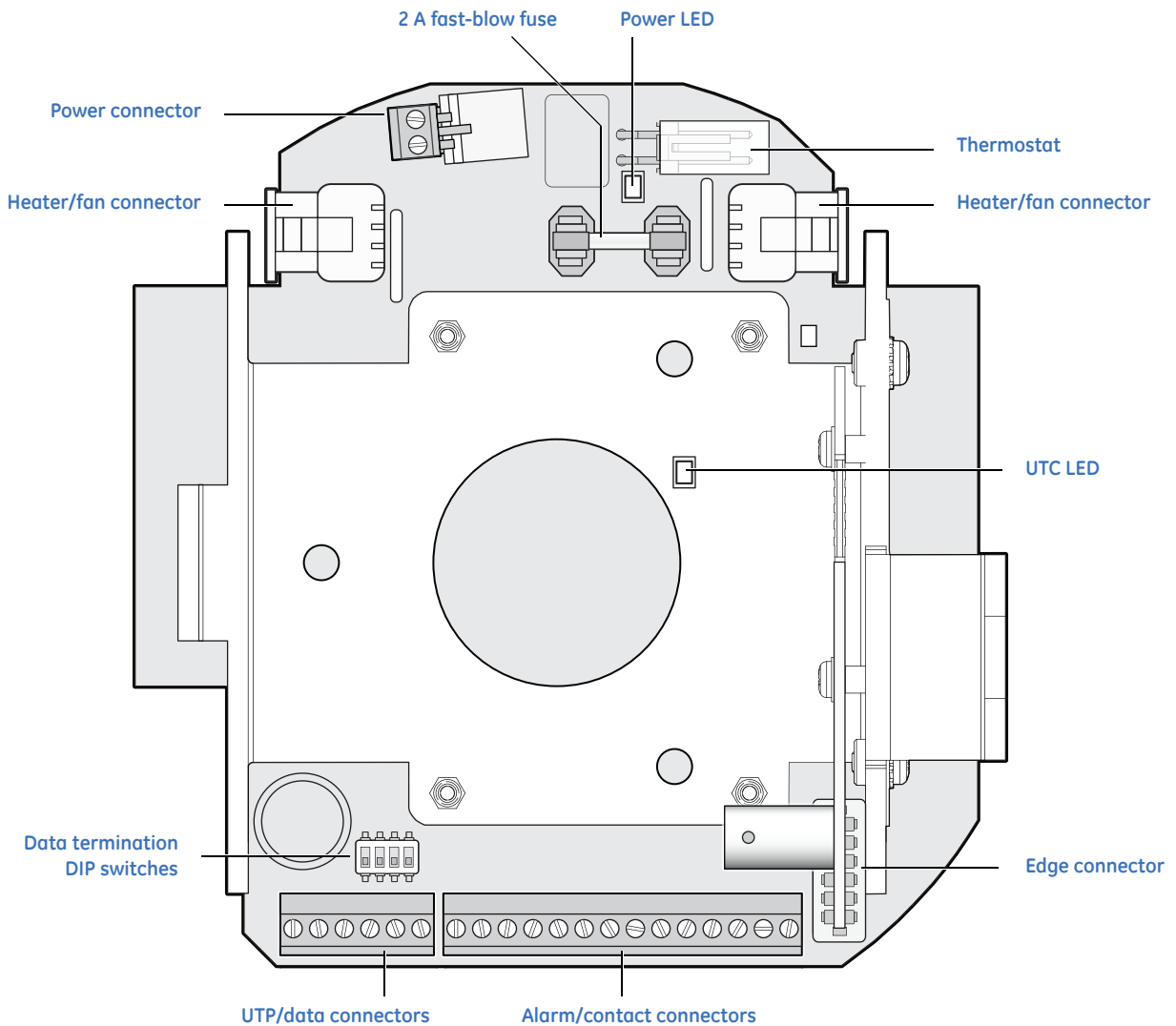


Table 5 on page 21 explains the red and green LED activities for the housing board.

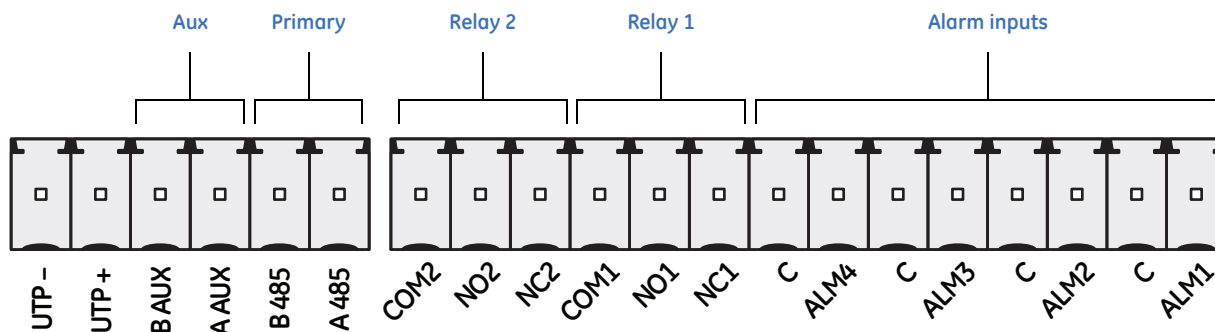
Table 5. Cyberdome II housing interface board UTC LED functions

Configuration type	LED	Description
Active housing	Red	Indicates power is applied to the housing.
	Green	Indicates communication activity: <ul style="list-style-type: none"> <li>• Blinks at a fast rate (7 Hz) when FSK (frequency shift keying) decoder is tuning.</li> <li>• Blinks at a slow rate (0.5 Hz) when decoder is locked and receiving.</li> </ul>
Select housing	Red	No indication; not connected.
	Green	Indicates communication activity: <ul style="list-style-type: none"> <li>• Blinks at a fast rate (7 Hz) when processor is active but idle.</li> <li>• Blinks irregularly—at various rates—during communication between the PTZ and the housing interface board.</li> </ul>

### Alarm/contact connectors

Figure 18 shows the descriptions for the alarm/contact terminals at the bottom edge of the housing board. The inside of the camera housing has a color-coded label to help you determine which terminal is which. These connectors are only available on alarm models.

Figure 18. Data and alarm/contact connectors



**Note:** Use dry contacts for alarms. This unit’s relays are rated to a maximum operating voltage of 30 VAC or 30 VDC at 0.5 A.

## Wiring the housing board

To wire the housing board, do the following:

---

**WARNING:** Do not run any cables next to the heaters. Doing so could damage the dome or cause an electrical fire.

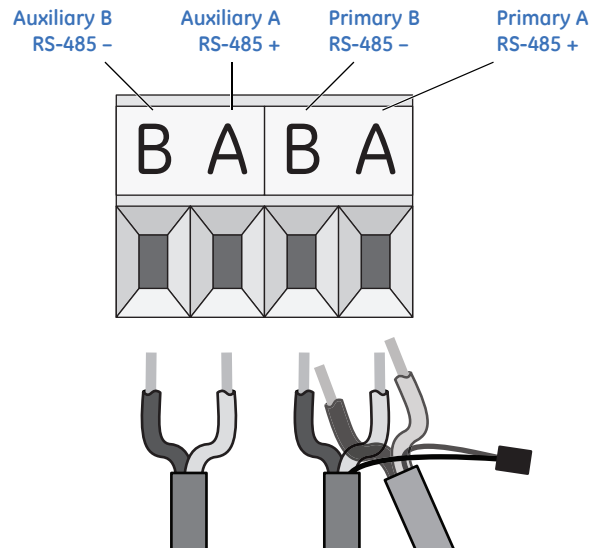
---

1. Connect the facility data cables to the main connections, which are the B and A terminals on the provided 6-pin or 2-pin terminal strip (*Figure 19*). The main data connections on the terminal strip are for control wires that are coming in from the keypad. You may also daisy-chain the data signal to additional domes.

**Note:** If you are installing RS-485 data, float the shield at the dome and connect it at the keypad.

---

Figure 19. Data connections



2. Connect the facility video cable (*Figure 20*).

**Note:** Use only crimp-on BNC connectors. Do not use screw-on connectors.

---

Figure 20. Video connection

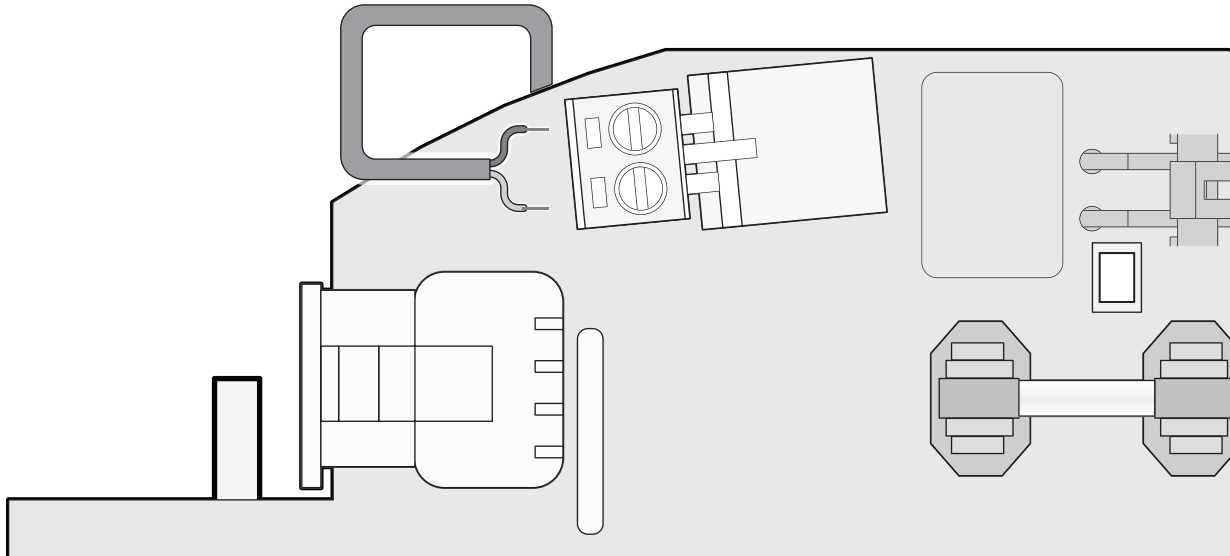


If you are installing UTP video, use the UTP terminals on the six-pin terminal strip. It provides connections for UTP video. If you are installing coaxial video, locate the BNC connector.

**Note:** UTP, which is polarity sensitive, is only available on standard modules with a six-pin connector.

3. Connect the facility power cable (*Figure 21*). Use the provided 2-pin power terminal strip. If you are using a heavier gauge cable, ensure that it is properly seated in the connector.

Figure 21. Power connection

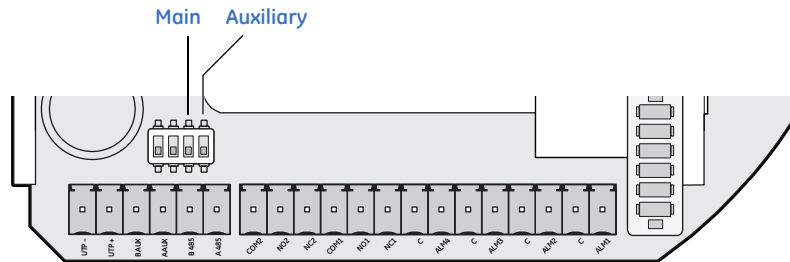


When power is received by the housing board through the power connection, the housing board's diagnostic power LED will appear orange.

## Setting the termination

You must set the termination of the data signal in each dome (or device) to on or off. Only two of the four switches (3 and 4) on the DIP switch block are used (*Figure 22*). Switches 1 and 2 are not used at this time, so it does not matter whether they are set to on or off.

Figure 22. Termination switches



To set the termination, do the following:

1. Set both termination switches to *on* if the dome or device is the final receiver location for the data signal.
2. Set both termination switches to *off* if the data signal needs to loop out to other domes or devices.

**Note:** The switches are set to *off* by default. If this is the only device on the data signal bus or the last in a chain of devices on the bus, then you need to switch them *on*.



## Chapter 4 Camera assembly, shroud, dome

This chapter provides instructions for installing the camera assembly, a shroud, and a dome.

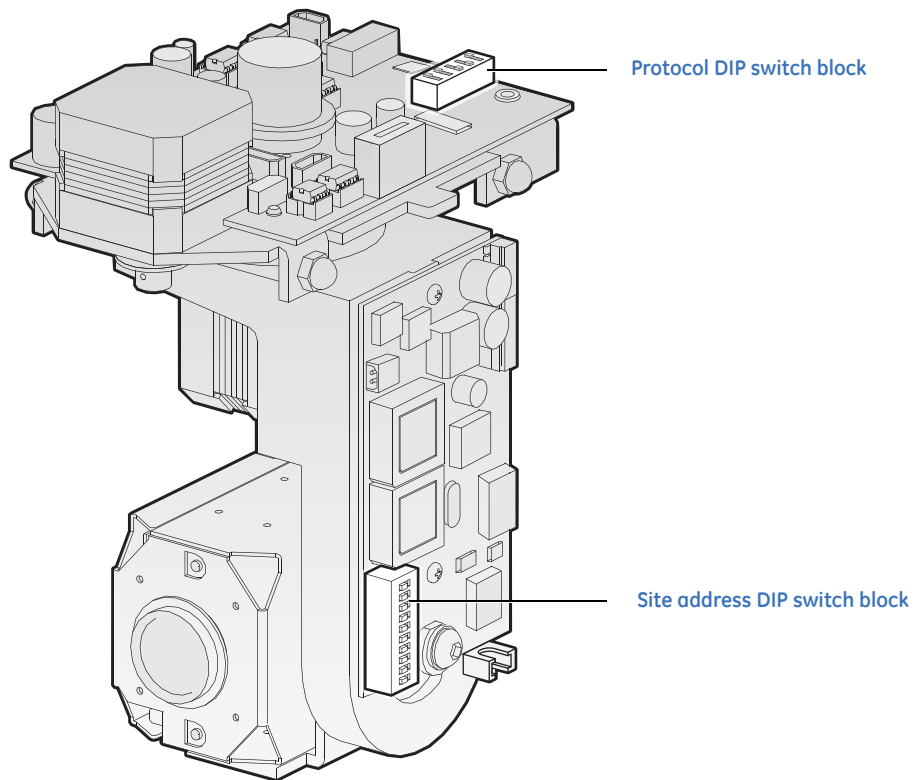
In this chapter:

<i>Camera assembly preparation and installation</i> .....	26
<i>Setting the protocol</i> .....	27
<i>Setting the camera's address</i> .....	28
<i>Installing the camera assembly</i> .....	30
<i>Shroud and bubble dome installation</i> .....	30
<i>Installing a camera shroud</i> .....	31
<i>Installing a dome</i> .....	32

## Camera assembly preparation and installation

Before you install the camera assembly in the housing, you should set the address and protocol DIP switches. CyberDome II has two multiposition DIP switch blocks: one on the upper board and one on the main board of the camera assembly (*Figure 23*). These DIP switches set the communication protocol and assign the camera a site address number respectively.

Figure 23. Protocol and site address DIP switch blocks



## Setting the protocol

CyberDome II can use different protocols for communication. To select a protocol, you must set the protocol DIP switches to the correct sequence of 1s (on) and 0s (off).

To set the protocol DIP switches to select a protocol, do the following:

1. Locate the protocol DIP switch block (*Figure 23* on page 26).
2. Using *Table 6*, find the DIP switch sequence for the desired protocol and set the switches accordingly.

CyberDome II stores programming settings in NVRAM in both the housing and the PTZ module. If the protocol switches are not set to one of the copy settings (01111 or 11111) and the two memories are different, *Memory* flashes onscreen. When you first log onto the menu system, you will be asked which settings you would like to use. For more information on protocol functionality with the CyberDome II camera, see *Appendix B, Protocol functionality* on page 49

Table 6. Protocols

Protocol	Switch position <sup>a</sup>	Protocol	Switch position <sup>a</sup>
Automatic selection <sup>b</sup>	00000	AD RS-422	01010
GE Digiplex RS-422 4800	10000	AD Manchester	10010
GE Impac RS-485 9600	01000	Bosch RS-232	00110
GE ASCII RS-422 9600	11000	Bosch biphas	10110
Pelco D autobaud	00100	Coaxitron	11110
Pelco P autobaud	10100	KD6	10001
Ultrak 9600	01100	Serial update 9600	11011
BBV	01110	Serial update 115200	00111
VCL	11100	Clear settings	10111
Panasonic	11010	Copy settings from PTZ to housing	01111
Vicon	00010	Copy settings from housing to PTZ	11111

a. 1 = on, 0 = off.

b. The *Automatic* selection will automatically determine only the GE protocols (Digiplex, Impac, and ASCII).

## Setting the camera's address

To set the DIP switches to indicate a site number, do the following:

1. Locate the site address DIP switch block (*Figure 23*).
2. Using *Table 7*, determine which DIP switches when turned on will add up to the site number for the camera and set those switches to the *on* position. See *Figure 24* for an example.
3. Place the switches that correspond to those values in the on position.

Table 7. Dip switch positions and equivalent values

DIP switch position number	1	2	3	4	5	6	7	8	9	10	11	12
Equivalent value	1	2	4	8	16	32	64	128	256	512	--	--

Figure 24. Address DIP switches (set to 210: 128 + 64 + 16 + 2)

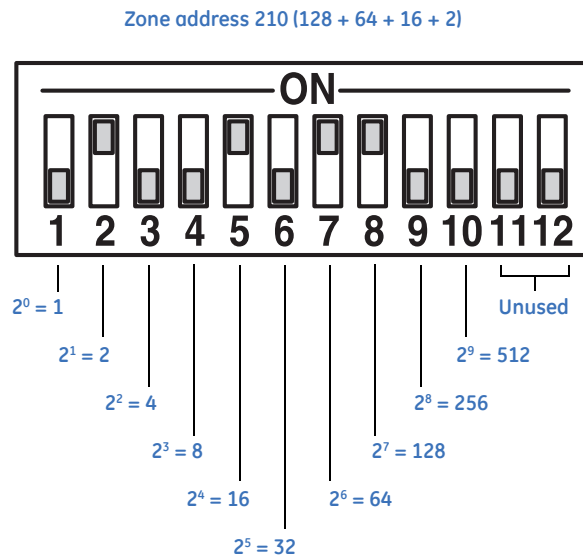


Table 8 on page 29 shows the DIP switch settings for cameras 1 through 64.

Table 8. Address DIP switch settings for cameras 1 to 64

Unit	DIP switch	Unit	DIP switch	Unit	DIP switch	Unit	DIP switch
1		17		33		49	
2		18		34		50	
3		19		35		51	
4		20		36		52	
5		21		37		53	
6		22		38		54	
7		23		39		55	
8		24		40		56	
9		25		41		57	
10		26		42		58	
11		27		43		59	
12		28		44		60	
13		29		45		61	
14		30		46		62	
15		31		47		63	
16		32		48		64	

## Installing the camera assembly

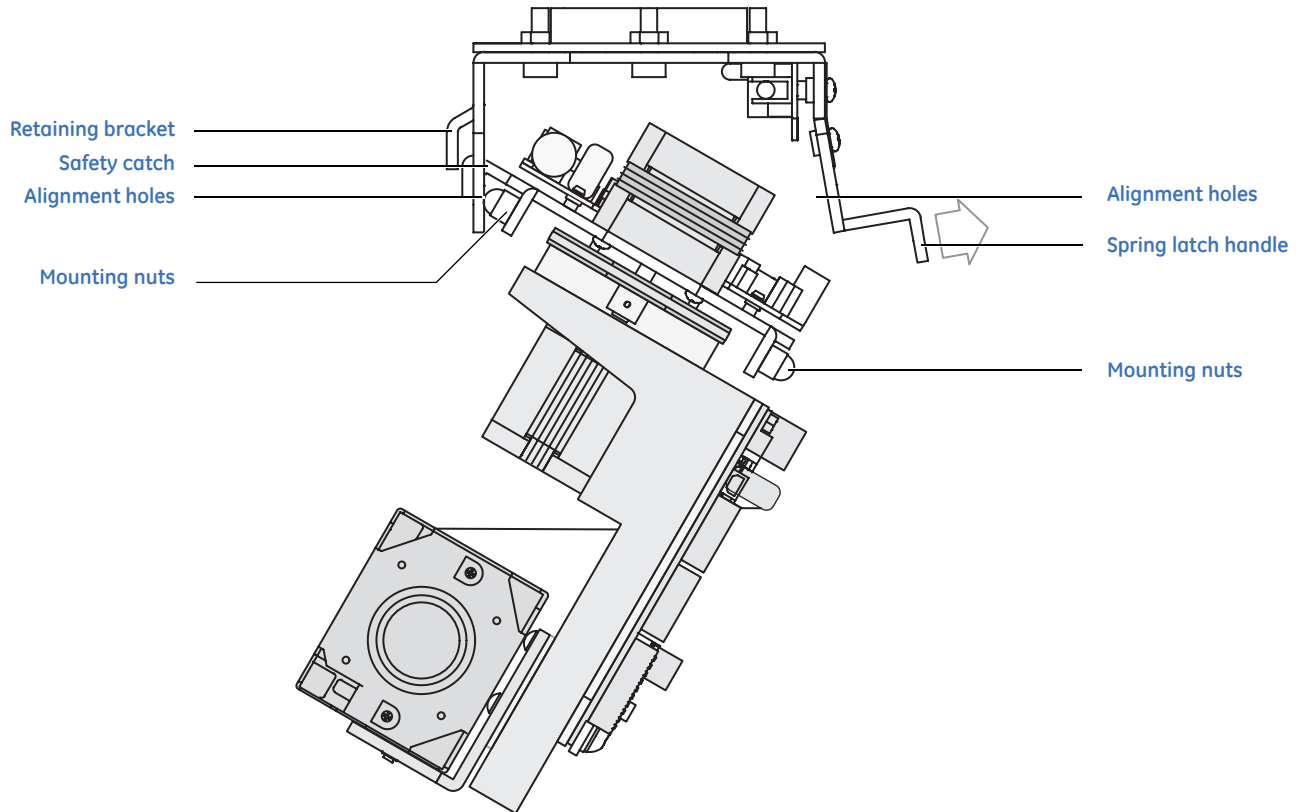
Installing the camera involves securing the pan/tilt assembly to the upper housing.

**Note:** You may install the pan/tilt assembly while power is applied to the housing.

To install the pan/tilt assembly, see *Figure 25* and do the following:

1. Insert the safety catch through the channel in the retaining bracket attached to the upper housing.
2. Push the spring latch handle outward, while pivoting the pan/tilt assembly up until it is vertical.
3. Secure the pan/tilt assembly by releasing the latch handle and engaging the catch tab.
4. Verify that the four mounting nuts mate with the four alignment holes.

Figure 25. Installing the pan/tilt assembly



## Shroud and bubble dome installation

A camera shroud obscures camera orientation so subjects can't be certain which direction the camera is pointing. We also offer several types of camera bubbles—from transparent to smoke and one-way reflective surfaces—to protect the camera and further hide the camera's operation.

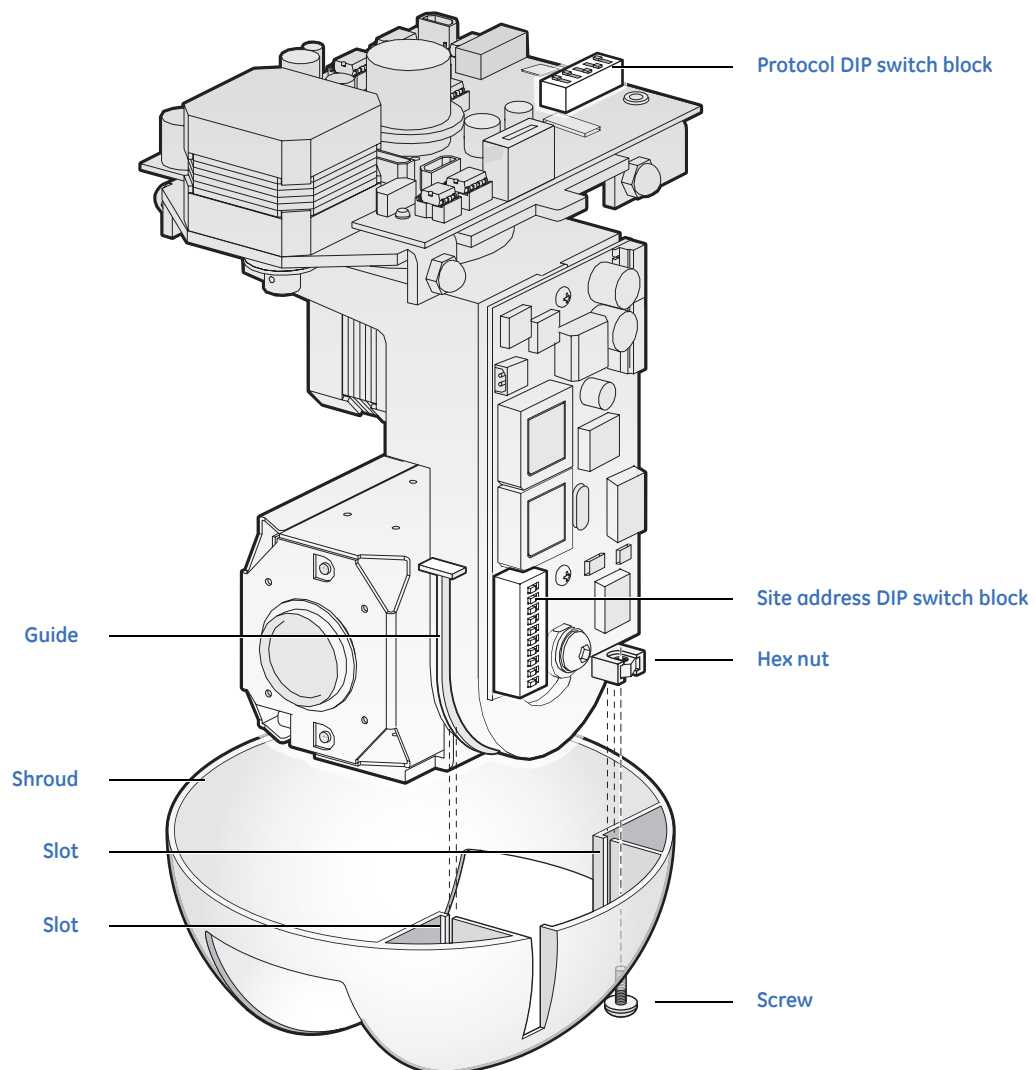
For flush-mount housings, install the PTZ assembly in the housing before attaching the shroud. For other housings, it is easier to attach the shroud after the PTZ assembly is installed, but it is not required.

## Installing a camera shroud

To install a camera shroud, see *Figure 26* and do the following:

1. Slide the camera guide into the two slots in the shroud and make sure the camera can tilt without being limited or blocked.
2. Using the provided screw, attach the shroud to the camera (5 in-lb. torque).
3. Install or reattach the dome onto the housing.
4. Test the camera's pan and tilt movements to make sure the shroud does not impede operation or block the camera's view. If you have a protocol error or a video blackout, see *Troubleshooting* on page 36.

Figure 26. Camera shroud installation



## Installing a dome

There are a variety of domes and housings. The interlocking clips and safety cables may vary, but all domes have them.



**CAUTION:** To prevent damage, do not touch the dome with your bare hands, do not place the dome face down on any surface, and protect the dome from dust. Oil and acid residue from your hands can etch some dome surfaces and is difficult to remove. Use a scratch-resistant cloth or gloves when handling the dome.

---

To attach a dome to the housing, see *Figure 27* on page 33 and do the following:

1. Fasten the dome safety cable to the housing's safety clip.
2. Swing the dome up to the housing and align the dome's screws with the housing's dome screw holes.  
If you are installing a plastic pendant-mount housing, there are alignment guides on the housing ring that straddle the rear-facing screw hole of the dome ring.
3. Use the following guidelines for tightening the dome screws.
  - If you are installing a plastic pendant-mount or flush-mount housing, the dome screws are self-locking, quarter-turn captive screws and *require only a quarter turn to tighten*.



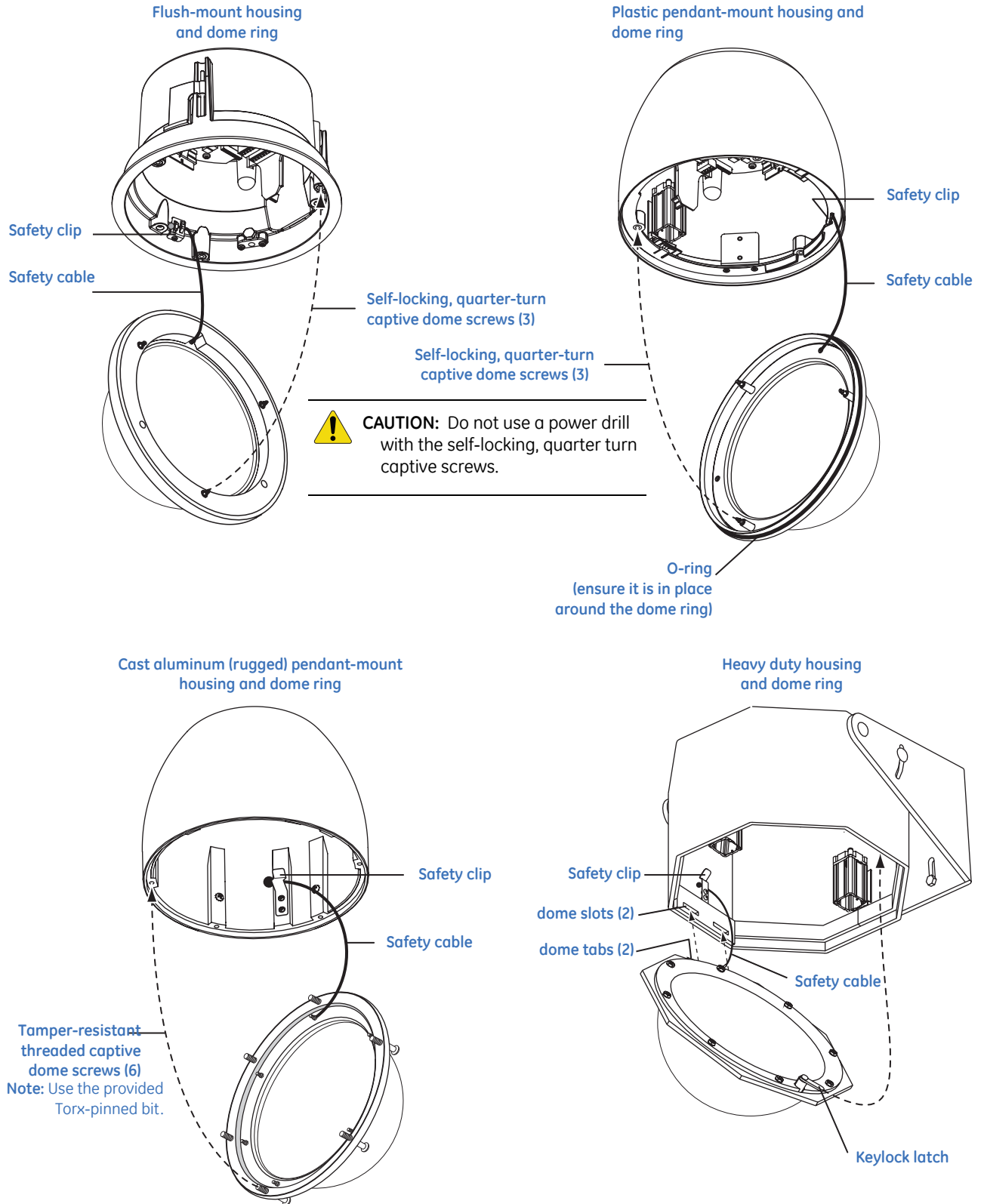
**CAUTION:** Do not use a power drill with the self-locking, quarter-turn captive screws. A power drill can strip the heads of the screws or the inside of the screw inserts (in the housing) enough to necessitate replacing the housing.

---

- If you are installing a flush-mount housing, the dome ring contains a foam pad that requires you to push up while turning the screws.
  - If you are installing the dome on a rugged vandal-resistant housing, the screws are tamper-resistant and require the provided security torx-pinned bit for tightening. Do not tighten these screws to more than 17 lb. inches (192 cNm) in torque.
4. Clean any fingerprints off of the dome. See *Cleaning the dome* on page 37.



Figure 27. Attaching the dome to the housing (cameras not shown to show safety clips clearly)





# Chapter 5 Troubleshooting, maintenance, support

This chapter provides information to help you troubleshoot problems, perform simple preventive maintenance procedures, and contact technical support in case you need assistance with your GE equipment.

In this chapter:

<i>Troubleshooting</i> .....	36
<i>Maintenance</i> .....	37
<i>Cleaning the dome</i> .....	37
<i>Contacting us</i> .....	38
<i>Online resources</i> .....	38

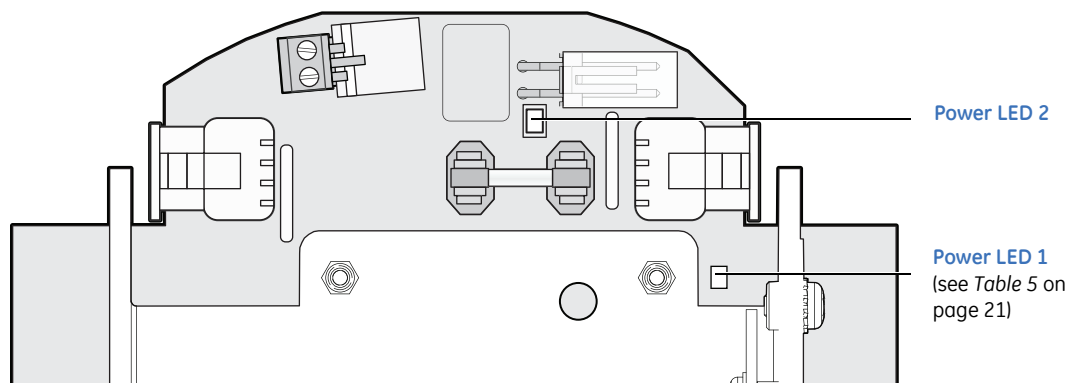
## Troubleshooting

This section provides information to help you diagnose and solve various problems that may arise while configuring or using your GE product.)

### Housing board power indication

When power is received by the housing board through the power connection, the housing board diagnostic LED appears orange (*Figure 28*). It appears orange because the red and green internal LEDs both illuminate. The housing board power LED is located on the PC board that is attached to the underside of the upper bracket. It can be seen before the camera assembly is installed.

Figure 28. Housing board power indication



### Common installation issues

Following are the most common troubleshooting issues and their solutions.

- *The dome is resetting during power-up, not powering up at all, or powering up but not operating as expected.*

Verify that you are supplying sufficient power for your model of dome. See *Table 2* on page 5.

- *Video is not appearing on the monitor screen.*

If the dome is not powered or the programming is not running properly, remove and reinstall the camera assembly. See *Camera assembly, shroud, dome* on page 25.

If the video still does not appear, then check the video cable and verify that it is properly connected. For UTP video, ensure that the + and - ends of the cable are correctly connected to maintain the polar sensitivity of the UTP video cable. See *Wiring the housing board* on page 22.

- *Either there is video, but no PTZ control, or Protocol flashes on the screen.*

First, verify the address of the dome. You can do this easily by pressing and holding the **view** key on the KTD-405 keypad. If the PTZ is receiving commands from the keypad, the dome's information will be displayed on the monitor screen. If necessary, correct the address and/or protocol using the procedure in *Setting the protocol* on page 27. If you still don't have control of the PTZ, verify that the data cable is properly connected. See *Wiring the housing board* on page 22.

Finally, try resetting (cycling) the power to the dome by turning the power off then on.

## Maintenance

Perform the following maintenance, when necessary or directed to.

### Cleaning the dome

Use the following procedures for cleaning the dome. Be aware that the interior of the dome requires extra care in cleaning. Use only the procedures provided below.



**CAUTION:** To prevent damage, do not touch the dome with your bare hands, do not place the dome face down on any surface, and protect the dome from dust. Oil and acid from your hands can etch some dome surfaces and are difficult to remove. Use a scratch-resistant cloth or gloves when handling the dome. Failure to comply may void your warranty.

---

### Cleaning the exterior of the dome

To clean the exterior of the dome:



**CAUTION:** Before using any cleaning agent, test on an inconspicuous spot of the unit to ensure that it doesn't damage the surface.

---

Use any nonabrasive cleaning cloth and a cleaning agent that is safe for use on polycarbonate or acrylic plastic. Liquid or spray cleaner/wax suitable for fine furniture is acceptable.

Do not use this procedure for cleaning the interior of the dome.

### Cleaning the interior of the dome

Use these procedures to clean the interior of the dome:

- To remove dust and other surface contaminants, use clean, dry, pressurized air to gently blow off loose material.
- To remove heavier contaminants, rinse the dome with water and immediately dry it with clean, dry, pressurized air to prevent water spots.
- To remove stubborn contaminants, use a “wick” to clean the dome’s surface. To make the wick:
  - a. Use a high-quality, soft paper towel.
  - b. Roll a section of the paper towel into a tightly wound tube, tear the tube in half, and wet a fuzzy end with 75% standard rubbing or isopropyl alcohol.
  - c. Hold the dome with its opening facing downward and wipe the interior with the wick (held at its dry end) using a circular motion starting from the outside and spiraling into the center.
  - d. Use a new wick for each of two additional passes over the dome.

## Contacting us

For help installing, operating, maintaining, and troubleshooting this product, refer to this document and any other documentation provided. If you still have questions, contact us during business hours (Monday through Friday, excluding holidays, between 5 a.m. and 5 p.m. Pacific Time).

Table 9. Technical support

<b>North America</b>	<b>Latin America</b>
T: 888 GE Security (888.437.3287) Toll-free in the US, Puerto Rico, and Canada. 503.885.5700 outside the toll-free area.	T: 305.593.4301
F: 888.329.0332 (Tualatin tech support) 561.998.6232 (Boca Raton tech support)	F: 305.593.4300
E: <a href="mailto:nstechsrv@ge.com">nstechsrv@ge.com</a> <a href="mailto:gesecurity.customerservice@ge.com">gesecurity.customerservice@ge.com</a>	E: <a href="mailto:InfraSec.TechnicalServicesLatinAmerica@ge.com">InfraSec.TechnicalServicesLatinAmerica@ge.com</a> <a href="mailto:InfraSecCustomerService.LatinAmerica@ge.com">InfraSecCustomerService.LatinAmerica@ge.com</a>
<b>Australia, New Zealand</b>	<b>Europe, Middle East, and Africa</b>
E: <a href="mailto:techsupport@gesecurity.com.au">techsupport@gesecurity.com.au</a>	W: At <a href="http://www.gesecurity.eu">www.gesecurity.eu</a> , select <i>Customer Support</i> .
	<b>China, India, Singapore, Taiwan, Southeast Asia</b>
	E: <a href="mailto:ges.asiatechservice@ge.com">ges.asiatechservice@ge.com</a>

**Note:** Be ready at the equipment before calling.

## Online resources

Here are some useful links on our website [www.gesecurity.com](http://www.gesecurity.com):

**Online library.** From the *Customer Support* menu, select the [Resource Library](#) link. After you register and log on, you may search for the documentation you need.<sup>1</sup>

**Training.** To view any available online training for GE Security products, select the [Training](#) link. (Online training is not available for all products.)

**Warranty and terms information.** From the *Customer Support* menu, select [Return and Warranty Policy Statement](#) or [Terms and Conditions Policy Statement](#).

**Customer service and technical support.** From the *Customer Support* menu, select [Customer Service](#) or [Technical & Application](#). Select the appropriate product category for the contact information or use the menu to select a location outside the US.

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1. Many GE documents are provided in English only as PDFs. To read these documents, you will need Adobe Reader, which you can download free from Adobe's website at [www.adobe.com](http://www.adobe.com).

# Appendix A Mount kits

This appendix provides the installation instructions for the mounts that are shipped with the dome kits. Dome kits include a wall-mount arm and a T-bar support kit. Instructions for all other mounts (arms, adapters, and brackets) are shipped with those mounts.

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<i>Installing the wall-mount arm</i> .....	40
<i>Opening a conduit hole</i> .....	43
<i>GEA-114 T-bar ceiling support kit</i> .....	45
<i>Installing the T-bar ceiling support kit</i> .....	45

## GEA-102 wall-mount arm

This cast aluminum wall-mount arm is used to mount a dome to a vertical surface. It is for indoor or outdoor use and mates with both the plastic indoor and cast aluminum outdoor pendant housings. It can be attached directly to a vertical surface or mated with a bracket (corner-mount, pole-mount, or roof-mount). Instructions for mating this mount to the various brackets are provided in the instructions for those brackets. The following instructions explain how to install the wall-mount arm directly to a vertical surface.

### Installing the wall-mount arm

To install the wall-mount arm, see the corresponding figures and do the following:



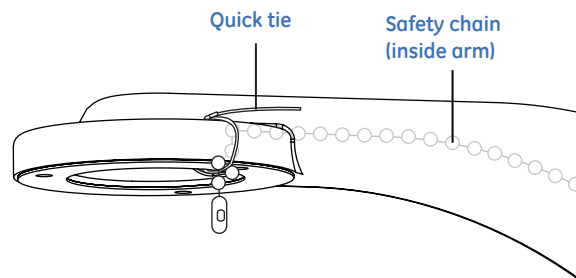
**CAUTION:** For all installations, heed these cautions:

- Complete all installation steps before supplying power to the dome.
- To ensure proper operation of a PTZ unit, install the mount level.
- For safety, the mounting surface, hardware, and procedure used for securing the dome must support the weight of the dome, mount (if used), cables, and any structural or environmental vibration according to local codes. See *Table 1* on page 4.

- 
1. The facility cables usually come out of the mounting surface and enter the arm through the rear opening in the base. If the cables are attached externally to the mounting surface and need to enter the arm through the side, open a conduit hole in the side of the arm with the instructions given in [Opening a conduit hole](#) on page 43.
  2. The factory secures the end of the safety chain to the collar opening with a quick tie (*Figure 29*). To keep the safety chain from slipping into the arm, leave the safety chain tied until you attach the dome to the arm.

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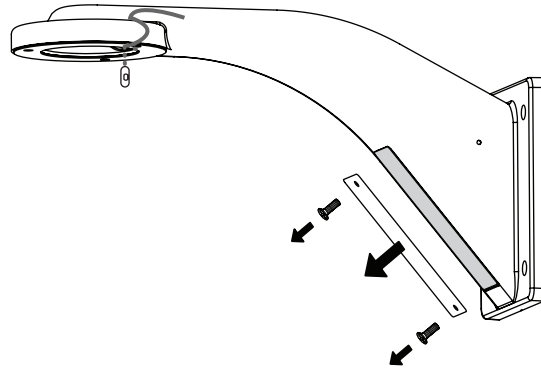
Figure 29. Leaving the safety chain tied



3. Remove the access cover (*Figure 30*).

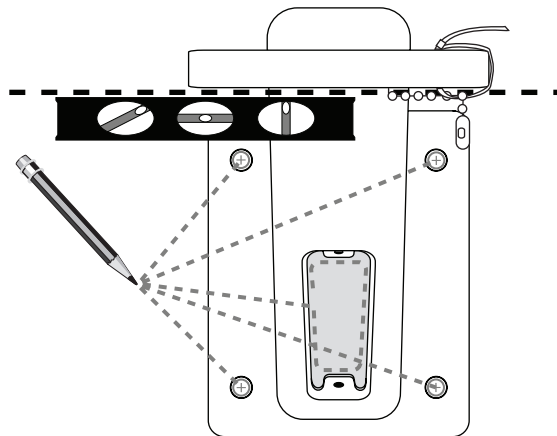


Figure 30. Removing the access cover



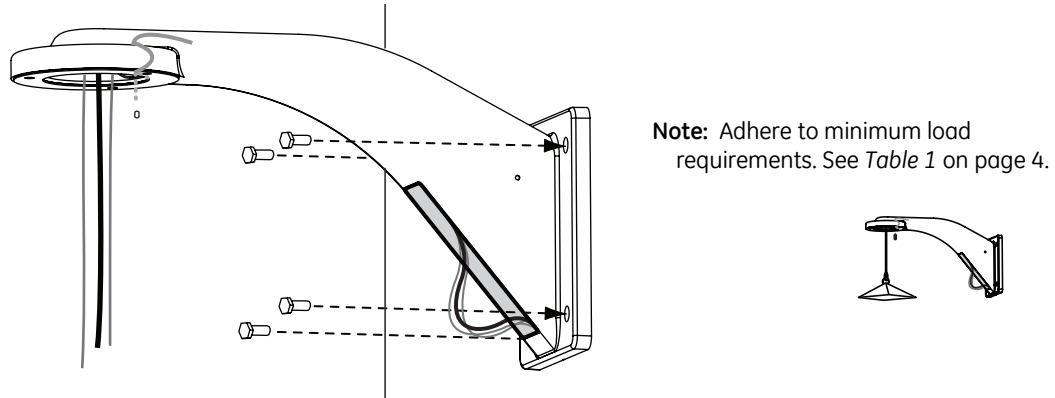
4. Using the arm as a template, place it level against the mounting surface and mark the position of the mounting holes, and if needed, the cable entry hole (*Figure 31*).

Figure 31. Marking the mounting and cable entry holes



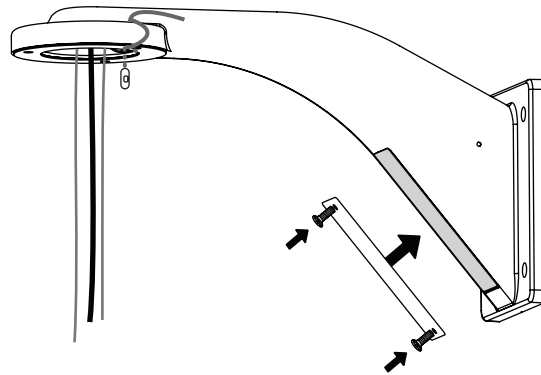
5. Following all local codes, drill and prepare the mounting holes, and if needed, cut the cable entry hole.
6. Feed the cables through the cable entry hole in the mounting surface or through the conduit attached to the opened conduit hole, and up through the arm.
  - Pull enough cable to make connections. You can always pull back unneeded length later.
  - Do not terminate the cables yet. Otherwise, they will not fit through the dust seal of the housing.
  - How many cables you pull depends upon how many video, data, and power cables you are using. See [Wiring](#) on page 19.
7. Securely fasten the arm to the mounting surface with the appropriate fasteners (*Figure 32*). Again, ensure that it is level.

Figure 32. Fastening the arm to the mounting surface



8. If needed, seal all mounting holes so that no moisture can leak into the mounting surface.
9. Push inside the arm or pull taut any looped cables that are extending out of the access area.
10. Reattach the cover (*Figure 33*).

Figure 33. Reattaching the access cover

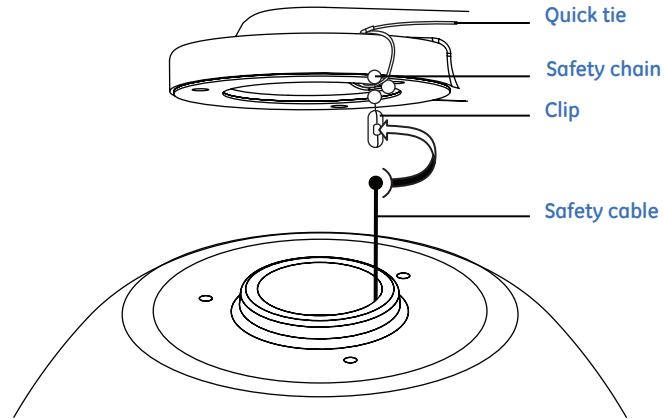


11. Before you attach the housing to the arm, attach the housing safety cable to the arm safety chain (*Figure 34*).

**Note:** The safety cable for rugged housings is metal and for plastic housings is a beaded cord.

- a. Cut the quick tie on the safety chain.
- b. Hold the housing near the arm's collar.
- c. Slide the ball of the safety cable into the clip of the safety chain.
- d. Ensure that the safety chain and cable can bear the housing's weight.
- e. Lower the housing until the safety chain and cable are taut.

Figure 34. Attaching the housing safety cable to the arm safety chain



12. Return to *Installing the housing* on page 11 to finish installing the dome.

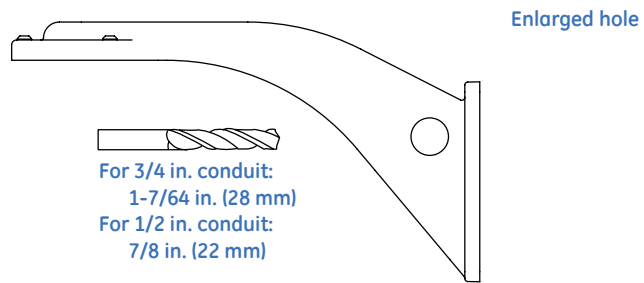
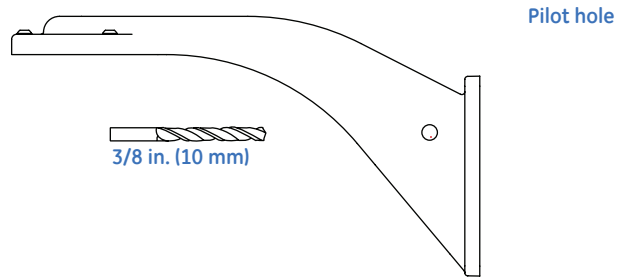
## Opening a conduit hole

Open a conduit hole for a 3/4 in. or 1/2 in. conduit connector, if you need to bring the facility cables in through the side of the arm.

To open the conduit hole, see *Figure 35* on page 44 and do the following:

1. Locate the dimple on the side of the arm.
2. Drill a 3/8 in. (10 mm) pilot hole through the dimple.
3. Enlarge the pilot hole to 1-7/64 in. (28 mm) for a 3/4 in. conduit connector or to 7/8 in. (22 mm) for a 1/2 in. conduit connector.
4. Return to step 2 of *Installing the wall-mount arm* on page 40.

Figure 35. Opening a conduit hole



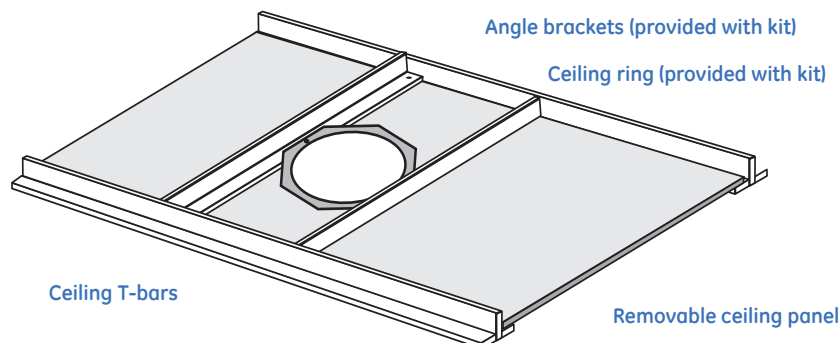
## GEA-114 T-bar ceiling support kit

The T-bar support kit is used to install a flush-mount dome into a paneled T-bar ceiling (*Figure 36*). T-bar ceilings consist of a grid of metal T-bars that support removable panels. The kit distributes the weight of the dome between the T-bars of the ceiling, instead of resting it on a panel.

### Product contents

- 1 ceiling ring
- 2 angle brackets
- mounting hardware (six 6-32 x 2-in. flathead screws)
- installation instructions

Figure 36. Parts of a supported T-bar ceiling



## Installing the T-bar ceiling support kit

One side of the ceiling ring is flat; the other side has two press nuts. Orient the ceiling ring as directed in the instructions.



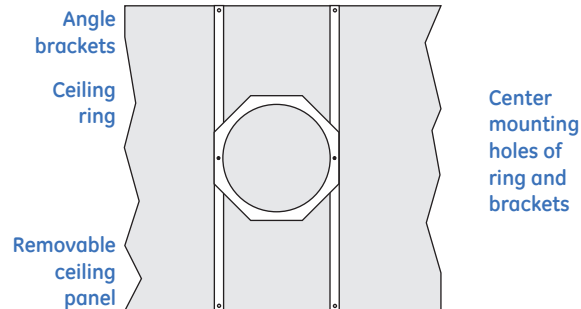
**CAUTION:** For all installations, heed these cautions:

- Complete all installation steps before supplying power to the dome.
- To ensure proper operation of a PTZ unit, install the mount level.
- For safety, the mounting surface, hardware, and procedure used for securing the dome must support the weight of the dome, mount (if used), cables, and any structural or environmental vibration according to local codes. See *Table 1* on page 4.

To install a T-bar ceiling support kit, see the corresponding figures and do the following:

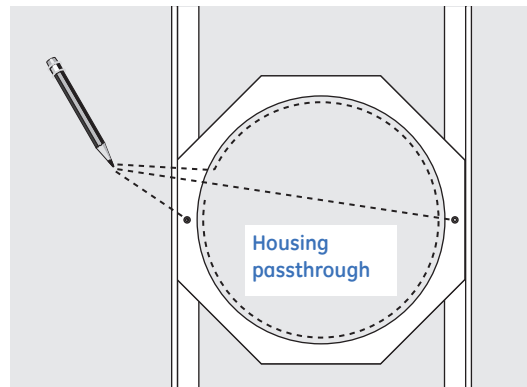
1. Remove the removable ceiling panel where the flush-mount housing will be installed.
2. Center the angle brackets and ceiling ring (flat side to the brackets) on the removable ceiling panel aligning their center mounting holes (*Figure 37*).

Figure 37. Aligning the angle brackets and ceiling ring on the panel



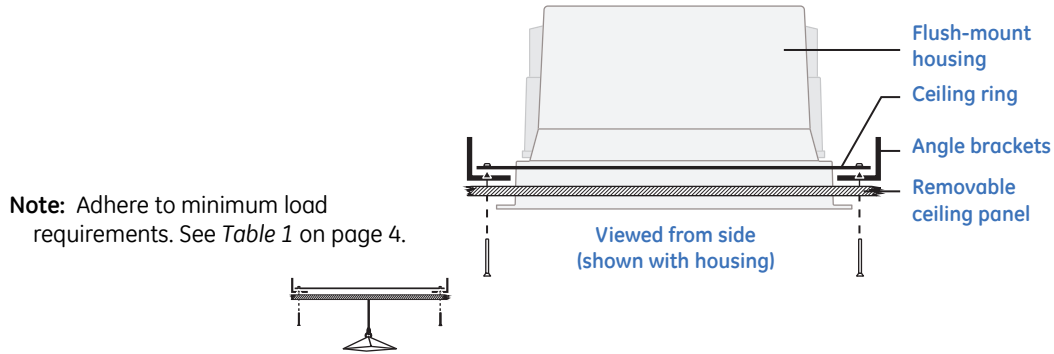
3. Using the ceiling ring as a template, mark the position of the center mounting holes and the housing passthrough hole on the removable ceiling panel (*Figure 38*).

Figure 38. Marking the mounting holes and housing pass-through hole



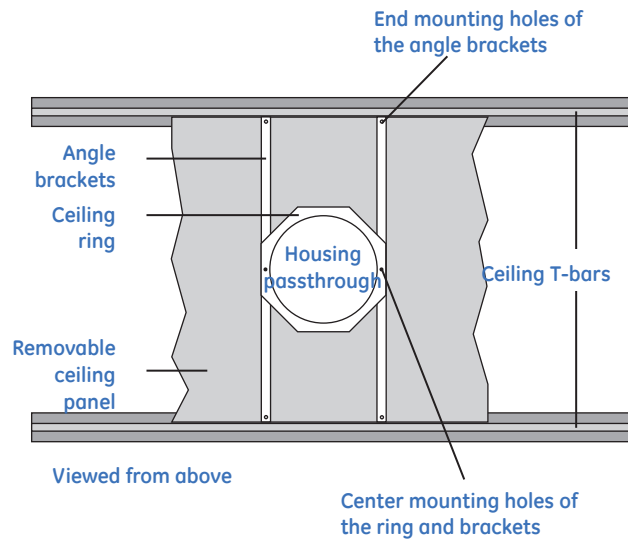
4. Following all local codes, drill the mounting holes (use a 3/16 in. drill bit) and cut the housing passthrough hole. Drill/cut all holes perpendicular to the panel and be careful not to overcut the housing passthrough hole.
5. Reset the angle brackets and ceiling ring on the removable ceiling panel aligning the center mounting holes of the brackets and ring with the drilled holes in the panel. Remember that the flat side of the ceiling ring lies on the angle brackets.
6. Using two of the fasteners provided, fasten the ceiling ring and the brackets to the panel through the center mounting holes (*Figure 39*). Tighten until snug, but not overtight.

Figure 39. Fastening the support kit onto the removable ceiling panel



7. Using the last four of the fasteners provided, fasten the ends of the angle brackets to the ceiling panel.
8. Reinstall the panel in the ceiling (*Figure 40*).

Figure 40. Installed T-bar support kit



9. Return to *Installing the housing* on page 14 to finish installing the dome.





# Appendix B Protocol functionality

This appendix provides information on protocol functionality.

In this appendix:

<i>CyberDome II protocol functionality</i> .....	50
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## CyberDome II protocol functionality

All Protocols support the following basic commands:

- Pan and tilt
- Zoom—wide and telephoto
- Iris—open and close
- Focus—near and far
- Addressing cameras

**Note:** Shaded cells in the tables below are unconventional by that protocol's standards.

Table 10. Pelco D and P commands supported

Command	Note
Set preset out of GUI	See Pelco keypad documentation
Go to preset XX	See Pelco keypad documentation
Flip (rotate 180 degrees)	Preset 33
Run pattern (learn number 1)	See Pelco keypad documentation
Set left limit stop	Preset 92
Set right limit stop	Preset 93
Enter into menu mode	Preset 95
Begin frame-scan (Preset tour number 1)	Preset 98
Begin autoscan (Pan)	Preset 99

Table 11. Ultrak commands supported

Command	Note
Set preset out of GUI	See Ultrak keypad documentation
Go to preset XX	See Ultrak keypad documentation
Run learn tour 1	Preset 80
Run learn tour 2	Preset 81
Run learn tour 3	Preset 82
Program learn tour 1	Preset 83
Program learn tour 2	Preset 84
Program learn tour 3	Preset 85
Run preset tour 1	Preset 87
Run preset tour 2	Preset 88
Run preset tour 3	Preset 89
Enter into menu	Preset 90
Day/night toggle	Preset 94

Table 12. VCL commands supported

Command	Note
Access menu mode	Preset 95
Set preset out of GUI	See VCL keypad documentation
Call preset #	See VCL keypad documentation
Start tour #	See VCL keypad documentation
Turn 180 degrees	See VCL keypad documentation
Toggle autoiris	See VCL keypad documentation
Toggle autofocus	See VCL keypad documentation
Manual day/night	Aux key
Power reset	See VCL keypad documentation
Camera reset	See VCL keypad documentation
Define a mimic tour	See VCL keypad documentation

Table 13. Vicon commands supported

Command	Note
Set preset out of GUI	See Vicon keypad documentation
Go to preset XX	See Vicon keypad documentation
Enter into menu mode	set preset 94
Left pan limit	AUX2
Right pan limit	AUX3
Autopan	A/P
Autoiris	A/I
Run preset tour 1-4	Set preset 80-83
Run learn tour 1-4	Set preset 84-87
Show splash screen	AUX1
Day/night toggle	AUX4
Flip (rotate 180 degrees)	AUX5

Table 14. AD RS-422 commands supported

Command	Note
Access menu mode	94 view
Set preset out of GUI	See AD keypad documentation
Call preset #	See AD keypad documentation
Start tour #	Enter #, 'Pattern' key
Turn 180 degrees	Flip' key

Table 15. Panasonic commands supported

Command	Note
Set preset out of GUI	See Panasonic keypad documentation
Go to preset XX	See Panasonic keypad documentation
Enter/exit into menu mode	Press the button of "CAMERA SETUP/SETUP/PROGRAM" for 2 seconds while the "SHIFT" indicator is lit (or not)
Autopan	press the button of "AUTO"
Run preset tour 1	"Press the numeric button 3 then press AUTO or [7]+[2]+[CAM FUNCTION]"
Run preset tour 2	"Press the numeric button 2 then press AUTO or [7]+[3]+[CAM FUNCTION]"
Run learn tour 1	"CAMERA SETUP + PATROL PLAY or [1]+[6]+[5]+[CAM FUNCTION]"
Run learn tour 2	[1]+[9]+[4]+[CAM FUNCTION]
Run learn tour 3	[1]+[9]+[5]+[CAM FUNCTION]
Run learn tour 4	[1]+[9]+[6]+[CAM FUNCTION]
Program learn tour 1	"CAMERA SETUP + PATROL LEARN or [1]+[6]+[7]+[CAM FUNCTION]"
Program learn tour 2	[1]+[9]+[7]+[CAM FUNCTION]
Program learn tour 3	[1]+[9]+[8]+[CAM FUNCTION]
Program learn tour 4	[1]+[9]+[9]+[CAM FUNCTION]
Home position	HOME/ESC
Flip	[1]+[7]+[8]+[CAM FUNCTION]
Day/night toggle	Press the AUTO/B/W/PATROL STOP button while the SHIFT indicator is lit

Table 16. Bosch RS-232 commands supported

Command	Note
Set preset out of GUI	SET-XX-ENTER
Go to preset XX	SHOT-XX-ENTER
Enter into menu mode	ON-46-ENTER
Pan flip (180), Bosch dome does 360	ON-1-ENTER
Left pan limit	SET-62-ENTER
Right pan limit	SET-63-ENTER
Autopan	ON-2-ENTER
Run preset tour 1	ON-8-ENTER
Run preset tour 2	ON-7-ENTER
Run learn tour 1	ON-50-ENTER
Run learn tour 2	ON-52-ENTER
Program learn tour 1	ON-100-ENTER
Program learn tour 2	ON-101-ENTER
Show splash screen	ON-997-ENTER

Table 17. KD6 commands supported

Command	Note
Set preset out of GUI	See KD6 keypad documentation
Go to preset (preshot) XX	See KD6 keypad documentation
Turn off coordinate display	Diagnostics display off
Turn on coordinate display	Diagnostics display on
Home	Find home position
Run preset tour 1	Continuous vectorscan 1 or preshot 87
Run preset tour 2	Continuous vectorscan 2 or preshot 88
Run preset tour 3	Continuous vectorscan 3 or preshot 89
Run preset tour 4	Continuous vectorscan 4
Autopan	Continuous vectorscan 0
Day/night toggle	Preshot 99 or preshot 94 or nightshot mode
Run learn tour 1	Preshot 80 or PTZ tour
Run learn tour 2	Preshot 81
Run learn tour 3	Preshot 82
Program learn tour 1	Preshot 83 or PTZ tour program
Program learn tour 2	Preshot 84
Program learn tour 3	Preshot 85
Delete learn tour 1	PTZ tour delete
Enter menus	Preshot 90 or setup menu
Freeze	Preshot 95 or freeze
Flip	Preshot 96 or flashback
Reset	Preshot 98 or camera power cycle

## Equipment protocol testing list

Table 18. Keypads used for testing protocols

Protocol	Keypad used
GE Digiplex RS-422 4800 baud	KTD-405
GE Impac RS-485 9600 baud (+KB3)	KTD-405 + CBR-KB3
GE ASCII RS-422 9600 baud	KTD-405 + KTD-313-1
Pelco D autobaud	MPT9500 @ 2400 baud & KBD300 @ 4800 baud, PC @ 9600 baud
Pelco P autobaud	KBD300 @ 4800 baud, PC @ 2400 & 9600 baud
Ultrak 9600 baud	Diamond JPD101 or Honeywell HJZTP
VCL	Ademco ADCJA or Honeywell HJZTP
Vicon	Vicon V1411J-DVC (standalone) mode
AD Manchester	GE KTD-405 + KTD-313
AD RS-422	ADTT16E + RCSN422
Panasonic	Panasonic WV-CU161C
Bosch RS-232	Bosch LTC 5136/61
Bosch Biphase	Bosch LTC 5136/61+ LTC 8786
BBV	BBV Tx400DC
Pelco Coaxitron	Pelco KBD300 + Pelco PT680-24P
KD6 Max Pro	Honeywell HJZTP



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