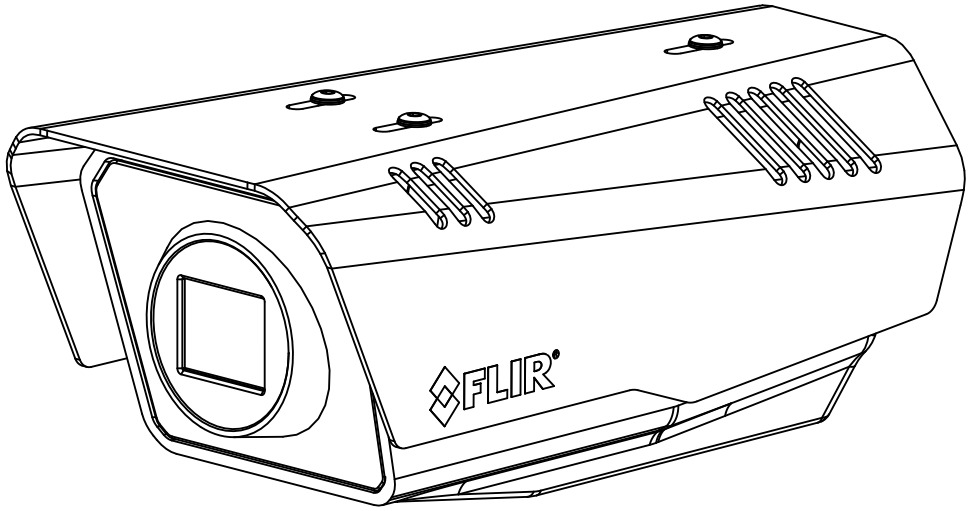
Installation Guide

FC-Series AI

FC-Series AI R



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Important Instructions and Notices to the User:

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.

Modification of this device without the express authorization of Teledyne FLIR LLC may void the user's authority under FCC rules to operate this device.

Note 1: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

Note 2: If this equipment came with shielded cables, it was tested for compliance with the FCC limits for a Class A digital device using shielded cables and therefore shielded cables must be used with the device.

Industry Canada Notice:
This Class A digital apparatus complies with Canadian ICES-003.

Proper Disposal of Electrical and Electronic Equipment (EEE)



The European Union (EU) has enacted Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE), which aims to prevent EEE waste from arising; to encourage reuse, recycling, and recovery of EEE waste; and to promote environmental responsibility.

In accordance with these regulations, all EEE products labeled with the "crossed out wheeled bin" either on the product itself or in the product literature must not be disposed of in regular rubbish bins, mixed with regular household or other commercial waste, or by other regular municipal waste collection means. Instead, and in order to prevent possible harm to the environment or human health, all EEE products (including any cables that came with the product) should be responsibly discarded or recycled.

To identify a responsible disposal method nearby, please contact the local waste collection or recycling service, the original place of purchase or product supplier, or the responsible government authority in the area. Business users should contact their supplier or refer to their purchase contract.

Document History

Revision	Date	Comment
110	August 2024	

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Image from a standard camera in low light



Image from a thermal camera in the same conditions

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1 Camera Installation

This manual describes how to install an FC-Series AI thermal camera, and includes:

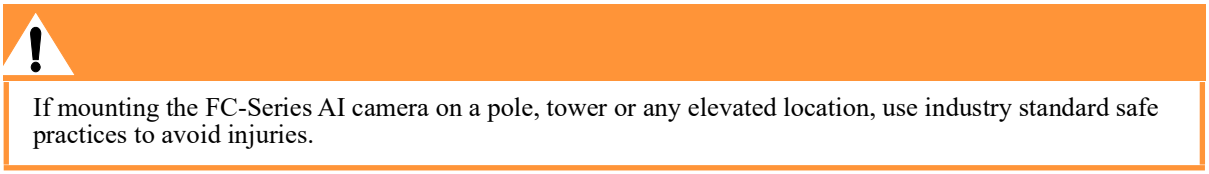
- Installation overview
- Mounting the camera and its components
- Connecting the camera
- Bench testing the camera
- Specifications

If help is needed during the installation process, contact the local FLIR service representative or contact support. All installers and integrators are encouraged to take advantage of the training offered by Teledyne FLIR; visit for more information.

For safety, and to achieve the highest levels of performance from the camera system, always follow the warnings and cautions in this manual when handling and operating the camera.

1.1 Warnings and Cautions

Warning!



If mounting the FC-Series AI camera on a pole, tower or any elevated location, use industry standard safe practices to avoid injuries.

Caution!

Except as described in this manual, do not open the FC-Series AI camera for any reason. Damage to the camera can occur as the result of careless handling or electrostatic discharge (ESD). Always handle the camera with care to avoid damage to electrostatic-sensitive components.

Prior to making any connections, ensure the power supply or circuit breaker is switched off.

Be careful not to leave fingerprints on the camera's infrared optics.

Operating the camera outside of the specified input voltage range or the specified operating temperature range can cause permanent damage.



During a heat test in an oven, with the ambient temperature above 70°C, the maximum measured temperature on the enclosure was 72.6°C. The maximum allowed touch temperature limit for accessible parts for very short periods is 70°C.

1.2 References

For information about how to use the camera's web page to operate and configure the FC-Series AI, see the *FC-Series AI User Guide*.

Documents are available from the Teledyne FLIR website.

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1.3 Installation Overview

The FC-Series AI and FC-Series AI R camera is an infrared thermal imaging camera intended for outdoor security applications, and can be installed in a fixed location or on a pan/tilt mechanism. The camera is intended to be mounted on a medium-duty fixed pedestal mount or wall mount commonly used in the security industry. The camera mount must support up to 5.4 lbs (2.5 kg).

Cables may exit from the back of the camera housing through the supplied cable gland or from the bottom of the camera housing when using the concealed cable wall mount (sold separately). A cable gland plug is supplied for the rear of the camera housing when cables are routed using the concealed cable wall mount.



1.3.1 Camera Connection Options

The camera can be installed with an analog or digital (IP) video output (or both). Analog video will require a connection to a video monitor or an analog video matrix switch.

The camera can be powered using Power over Ethernet Plus (PoE+ / IEEE 802.3at-2009) or with a conventional 24 Vac, 12 Vdc, or 24 Vdc power supply. The power supply must have PS2/LPS outputs (18-30 Vac or 12-32 Vdc or PoE 54 Vdc). If the camera is not connected to a PoE+ switch, it can be powered by a PoE+ injector; for example, Teledyne FLIR P/N 4210755. The maximum Ethernet cable run is 100 meters including the PoE+ power supply. Installations using PoE+ power and IP video require only a single Ethernet cable from the camera.

In installations using analog video and conventional power (24 Vac is commonly used in many installations), an RG59U coaxial cable and a three-conductor power cable are installed. Teledyne FLIR recommends installing an Ethernet cable for camera configuration, operation, and troubleshooting. For example, if the camera is mounted on a pole, an Ethernet cable should run at least to the bottom of the pole, for a laptop to be temporarily connected directly to the camera. The FC-Series camera does not support serial communications.

Network Security

The camera supports IEEE 802.1X authentication when connected to a network supporting the following requirements:

- Network device (Authenticator) such as an Ethernet switch configured with 802.1X
- Authentication server supporting TLS

Refer to the user guide for information on how to configure the LAN settings.

Alarm I/O Connections

The camera provides one alarm input connection and one alarm output connection. The output pins support a normally open or normally closed idle state; that is, when there is no alarm and when power is not being supplied to the camera.

PoE+ Power Supply

With PoE+, camera power is delivered to the camera over the Ethernet cable via the camera's standard RJ45 Ethernet connector. The FC-Series AI and FC-Series AI R cameras are Powered Devices compliant with the IEEE 802.3at-2009 standard, known as PoE+ or PoE Plus.

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Supplemental Lens Heater

The camera's supplemental lens heater provides lens de-fogging and de-icing in the event of:

- Power interruption that disables the camera for an extended period
- Freezing rain that fully covers the lens and obstructs the image

FC-Series AI and FC-Series AI R cameras are shipped from the factory with the supplemental lens heater disabled. The lens heater can be manually turned on or enabled to run automatically on the Heaters & Fans page in the System Settings section of the camera web page. For more information, see the *FC-Series AI User Guide*.

Important Note

The windows on the 60 mm lens and the 75 mm lens (FC-610 and FC-608 AI and AI R models) are not thermally conductive. These models are not suitable for installations that would require using the supplemental lens heater.

1.3.2 Camera Accessories

The following accessories are available for purchase from Teledyne FLIR.

- PoE+ power supply (PN 4210755) - For powering a single FC-Series AI camera using PoE+. In addition to PoE+ power and communications, the power supply provides surge protection. It complies with IEEE 802.3at.
- Concealed Cable Wall Mount (PN 4129742) - Includes camera mount gasket and hex wrench for adjusting the ball joint controlling the camera's view angle. The FC-Series AI camera is attached to the mounting arm using the four M5 threaded bottom mounting holes. A cable gland plug is supplied with the camera for the rear of the camera housing when cables are routed using the concealed cable accessory. Refer to Camera Mounting with Concealed Cable Wall Mount, pg. 6.



Concealed Cable Wall Mount

- Pole Mount Adapter Kit (PN 4132982) - Adapter kit that allows the Concealed Cable Wall Mount to be mounted to a pole (75 mm [3 in] min to 180 mm [7 in]; larger pole diameter requires use of customer supplied band clamps)

1.3.3 Supplied Components

The FC-Series AI and FC-Series AI R camera kits include:

- Fixed camera unit with sunshield and cable gland attached
- Cable gland plug and gland inserts
- Power terminal connector (installed)
- Alarm I/O terminal connector (installed)
- Tools: 3 mm hex key, slotted screwdriver

1.3.4 Additional Supplies

The installer needs the following items as required (specific to the installation):

- Customer-supplied microSD card (up to 512 GB) provides local storage of image files (optional)
- Power supply, 18 Vac to 30 Vac or 12 Vdc to 32 Vdc, if not using PoE+
- Power cable, 3-conductor, shielded, gauge determined by cable length and supply voltage, if used to power the camera

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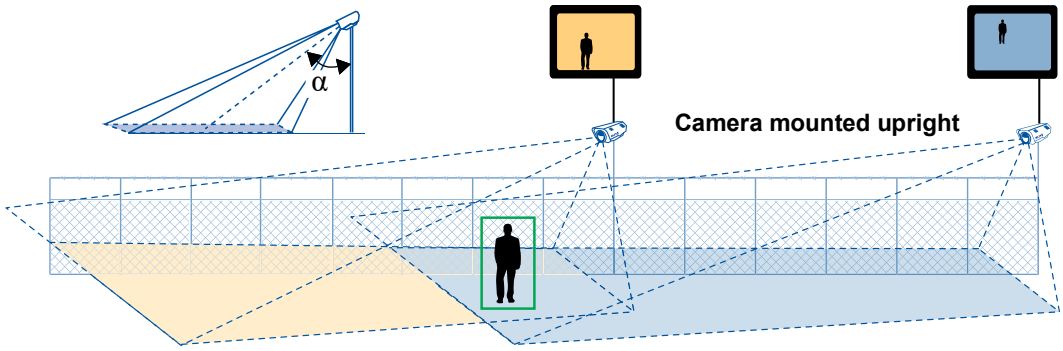
- 6-conductor alarm I/O cable (optional)
- PoE+ power supply or PoE+ switch, if not using Vac or Vdc power
- Cat5e or Cat6 Ethernet cable for PoE+, communications, and IP video
- Coaxial RG-59/U cable with BNC connector at the camera end, if using analog video
- Camera grounding strap, camera mount, electrical hardware, connectors, and tools

Be sure to use cables that fit in the cable gland holes, as described below. Refer to Rear Access Cable Gland Sealing, pg. 13 for more information.

1.3.5 Camera Placement

The FC-Series AI and FC-Series AI R cameras can be mounted upright, either on top of the mounting surface. or underneath an overhanging mounting surface such as eaves or an awning. The camera can also be mounted sideways to view a scene such as along a fence line or corridor. Adhere to all local and industry standards, codes, and best practices.

For installations with multiple FC-Series AI and FC-Series AI R cameras with on-board video analytics, the fields of view of cameras should overlap to remove all dead zones in which a camera cannot see a target “head to toe”. The camera’s on-board analytics must be calibrated to detect targets. Refer to the user guide.



- Install the camera at a minimum height of 6 m (20 ft).
- Mounting orientation (tilt) should ideally be at horizon level close to top of the scene.
- Ensure that cameras are mounted on stable mounts with minimal vibrations and maximal resistance to wind.
- The tilt angle (α) is the angle between vertical and the center of the camera field of view.

1.3.6 Camera Mounting for Rear Cable Access

The FC-Series AI and FC-Series AI R cameras can be secured to the mount with two in-line 1/4-20 threaded fasteners on the top or bottom of the camera. Alternatively the camera can be mounted with four M5 x 0.8 threaded fasteners to the bottom of the camera. Use Loctite 222 low strength threadlocker for the top mount fasteners (can be used with the bottom mount fasteners also).

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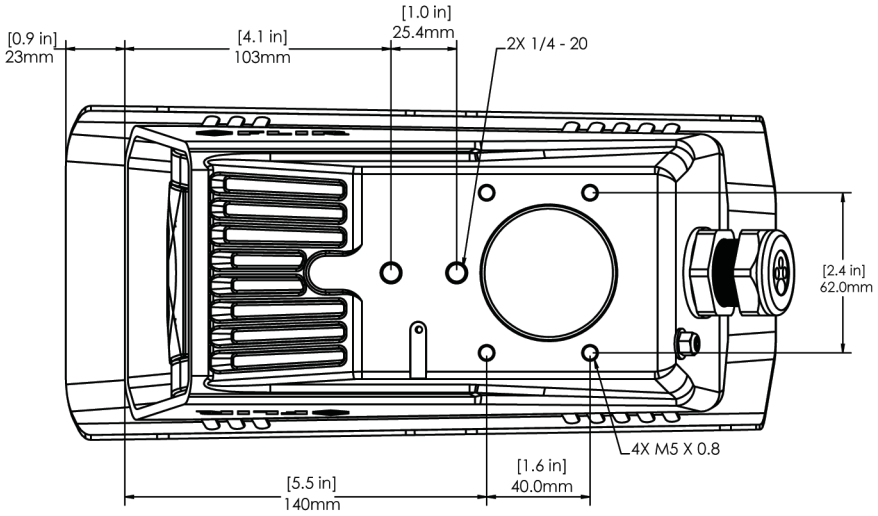


Figure 1-1: Bottom Mounting Holes

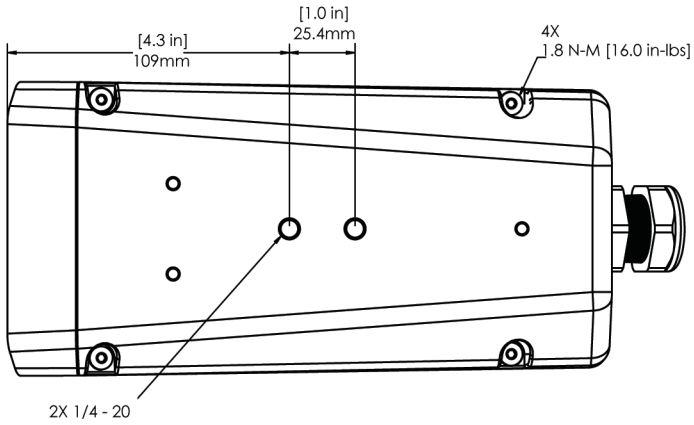


Figure 1-2: Top Mounting Holes

If using two 1/4-20 fasteners in the center of base, the maximum depth of the fastener should not exceed 12.5 mm (0.5 in). If using four M5 x 0.8 fasteners, the maximum depth of the fastener should not exceed 10.0 mm (0.4 in).

If using two 1/4-20 fasteners in the center of top, the maximum depth of the fastener should not exceed 12.5 mm (0.5 in). If the camera is mounted using the top of the camera, the sunshield must be removed.

As the diagram below indicates, be sure to allow adequate space for cable egress behind the gland. This requirement may vary, depending on the installation. Maintain the bend radius per the recommendation of the cable manufacturer. The typical cable bend radius is 50-75 mm (2-3 in).

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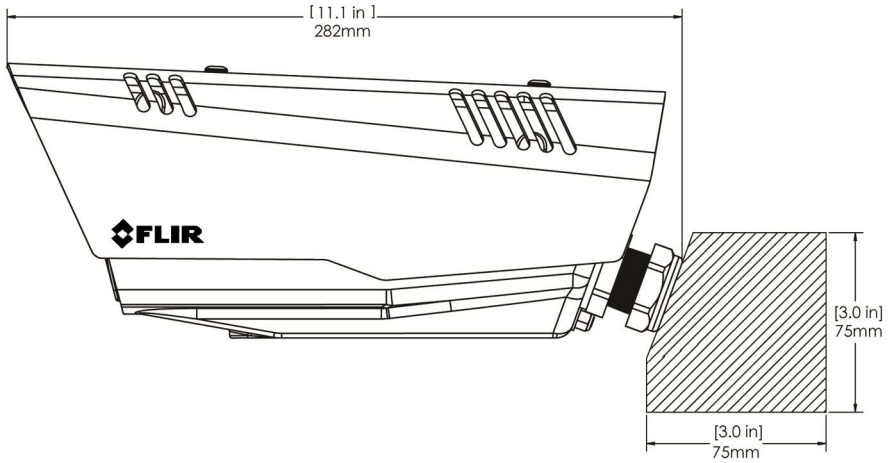


Figure 1-3: Rear Cable Bend Radius

1.3.7 Camera Mounting with Concealed Cable Wall Mount

The FC-Series AI and FC-Series AI R cameras can be secured to the optional Concealed Cable Wall Mount with four M5 x 0.8 threaded fasteners to the bottom of the camera. Use Loctite 222 low strength threadlocker for the mount fasteners. Refer to Concealed Cable Mount Accessory, pg. 14 for additional information.

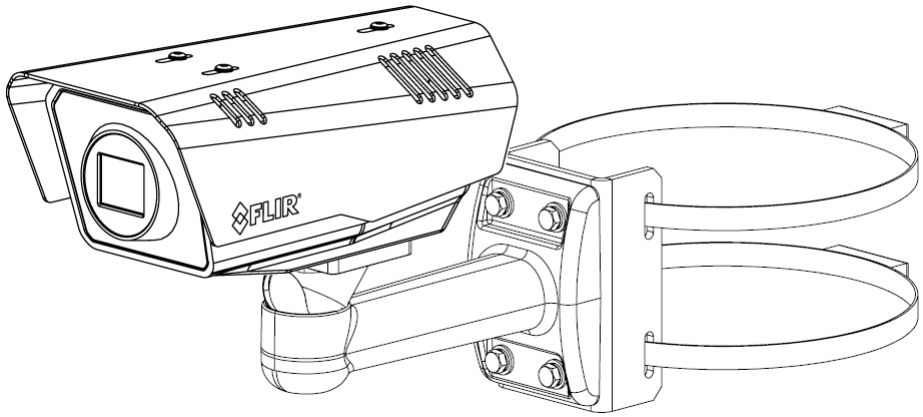


Figure 1-4: Camera with Concealed Cable Wall Mount and Pole Adapter Kit

1.3.8 Sunshield

The camera includes a sunshield that should be used for any installation where the camera is exposed to direct sunlight or precipitation. If the camera is mounted with the top mounting holes, the sunshield is not used. Depending on the needs of the installation, the sunshield can be positioned in the neutral (middle) position, or slightly forward or rearward. To change the position of the sunshield, temporarily loosen the three 3 mm hex screws on top, slide the sunshield forward or backward, and re-tighten the screws.

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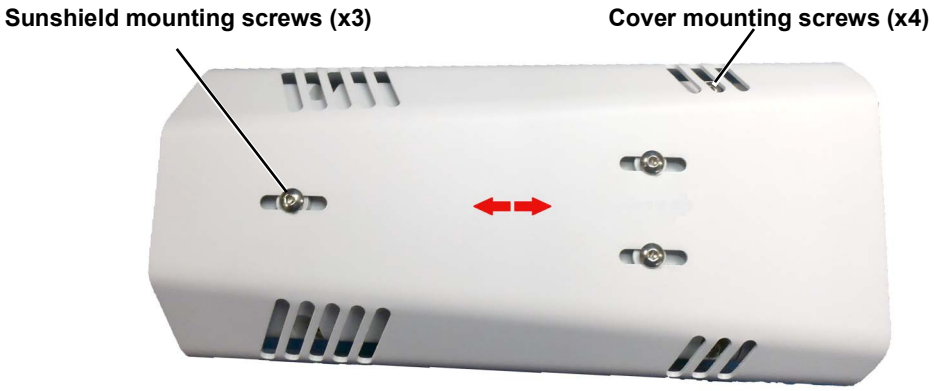


Figure 1-5: Sunshield Mounting

1.3.9 Removing the Cover

To access the electrical connections and install the cables, it is necessary to temporarily remove the top cover of the camera housing. The top cover of the camera is held in place with four 3 mm hex screws. The screws are accessible through slots in the sunshield, so the sunshield does not need to be removed from the top cover.

Use a 3 mm hex key to loosen the four captive screws, exposing the connections inside the camera enclosure. There is a grounding wire connected inside the case to the top cover, as shown. If it (or any of the grounding wires) is temporarily disconnected during the installation, it must be reconnected to ensure proper grounding of the camera.

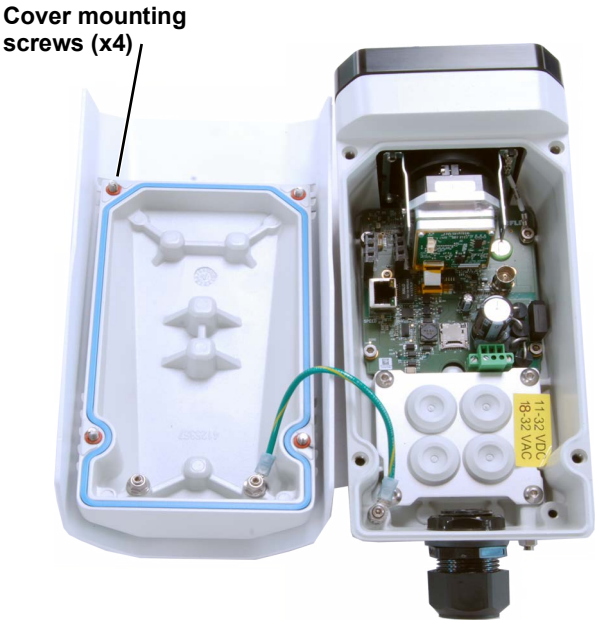


Figure 1-6: Cover Removed (Sunshield Attached)

When replacing the cover, tighten the four 3 mm hex screws to 1.8 n-m (16.0 in-lbs).

Caution!

When replacing the cover, ensure that the ground wire between the cover and the camera body is completely inside the o-ring groove. If the wire is pinched between the cover and body, the camera is not sealed against water ingress and can be damaged.

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1.4 Camera Connections

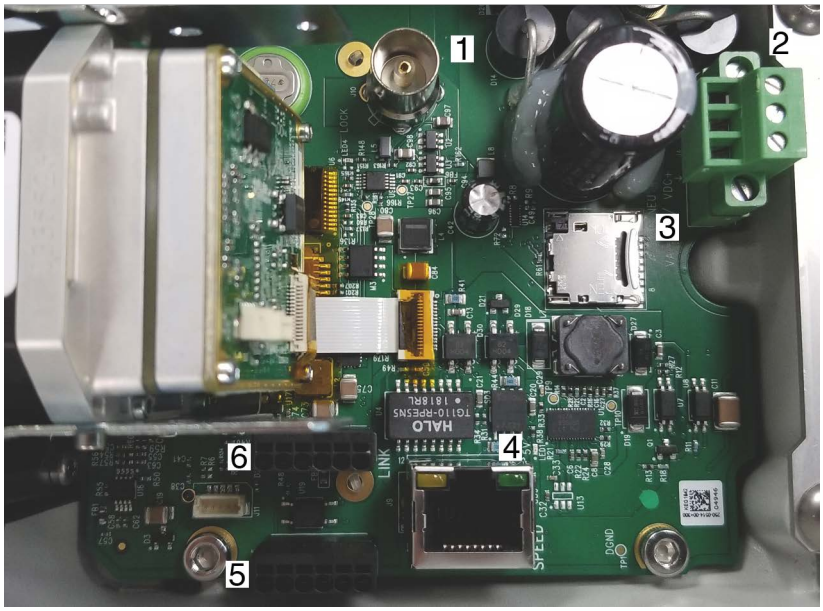


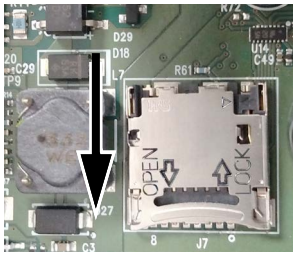
Figure 1-7: FC-Series AI & AI R Camera Connector

Table 1-1: FC-Series AI & AI R Camera Connectors

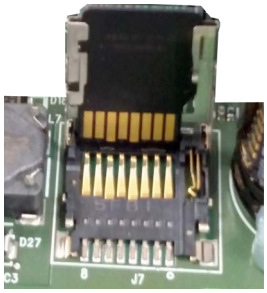
	Connector	Connection
1	BNC	Analog video
2	3-pin power terminal	Vac or Vdc
3	microSD card slot	Local storage of image files up to 512 GB (card not included)
4	Ethernet	PoE+, communications, IP video
5	6-pin terminal J5	Alarm I/O
6	6-pin terminal J3	Not in use

1.4.1 Installing the microSD Card

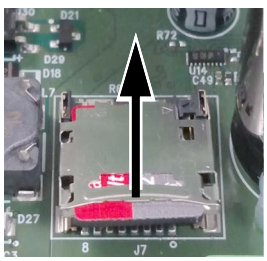
Pull back cage to unlock
Lift edge to open



Insert microSD card



Close cage,
press down and
push forward to lock



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1.4.2 Bench Testing

Note

If the camera is to be mounted on a pole or tower or other hard-to-reach location, it may be a good idea to connect and operate the camera as a bench test at ground level prior to mounting the camera in its final location.

The camera offers both analog video and IP video, and because the camera can be powered by PoE+ or by a conventional power supply, there are several ways to bench test the camera. It is recommended that the installer test the camera using the same type of connections as in the final installation.

Even if using analog video and conventional power in the final installation, it is a good idea to test the IP communications when performing the bench test. If any image adjustments are necessary, they can be done using a web browser over the IP connection, and saved as power-on default settings.

With the camera powered up, analog video can be tested at the BNC connector. Connect the camera to a video monitor and confirm the live video is displayed on the monitor.

If using a conventional power supply, connect the camera to a network switch with an Ethernet cable, and connect a PC or laptop to the switch also.

1.4.3 Configure for Networking

You can discover and configure the camera for networking using the FLIR Discovery Network Assistant (DNA) software tool; the camera's web page; or a supported VMS. Using the DNA tool or the camera's web page requires using the default admin user or any user assigned the admin or expert role.

Notes

- Teledyne FLIR recommends using the DNA tool to discover the camera on the network. Version 2.3.0.33 or higher supports FC-Series AI and FC-Series AI R cameras, does not require a license to use, and is a free download from the product's web page. For more information about using the DNA tool, including how to configure more than one camera at the same time, see the *DNA User Guide*. While the software is open, click the Help icon.
- For information using the camera's web page to configure the camera for networking, see the camera's user guide.
- For information about using a supported VMS to configure one camera or more than one camera at the same time, see the VMS documentation.

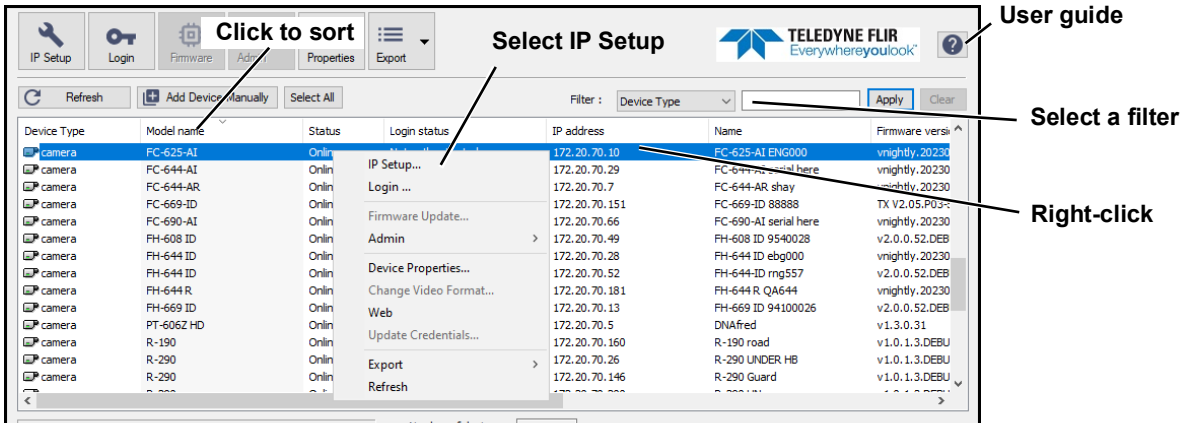
By default, DHCP is enabled on the camera and a DHCP server on the network assigns the camera an IP address. If the camera cannot connect to a DHCP server, the camera’s default IP address is 192.168.0.250.

- If the camera is managed by FLIR Horizon or Meridian VMS and the VMS is configured as a DHCP server, the VMS automatically assigns the camera an IP address.
- If the camera is managed by FLIR Latitude VMS or is on a network with static IP addressing, you can manually specify the camera’s IP address using the DNA tool or the camera's web page.

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Configure the Camera for Networking Using the DNA Tool

Step 1 Run the DNA tool (DNA.exe) by double-clicking . The Discover List appears, showing compatible devices on the VLAN and their current IP addresses.



In the DNA Discover List, verify that the camera's status is *Online*.

If this is the first time you are configuring the camera or if it is the first time after resetting the camera to its factory defaults, DNA automatically authenticates the camera with the default password for the camera's admin user (*admin*).

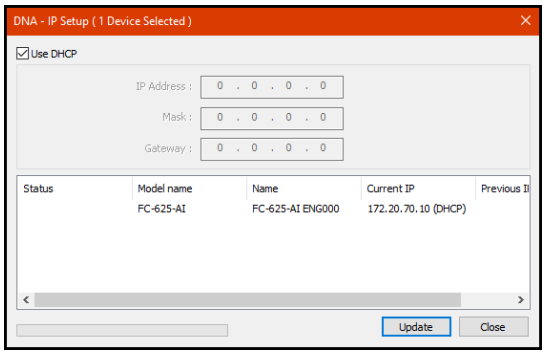
If the admin user password has been changed, you need to authenticate the camera. In the DNA Discover List, right-click the camera and select **Login**. In the **DNA - Login** window, type the password for the admin user. If you do not know the admin user password, contact the person who configured the camera's users and passwords. Click **Login**, wait for Ok status to appear, and then click Close.

In the DNA Discover List, verify that the camera's status is *Online* and *Authenticated*.

Step 2 Change the camera's IP address.

Right-click on the camera and select **IP Setup.**

In the **DNA - IP Setup** window, clear *Use DHCP* and specify the camera's IP address. You can also specify the *Mask* (default: 255.255.255.0) and *Gateway*. Then, click **Update**, wait for Ok status to appear, and then click **Close**.



1.4.4 Analog Video Connection

The analog video connection of the camera is a BNC connector. The video cable used should be rated as RG-59/U or better to ensure a quality video signal. Connect the shield of the external coaxial cable to the building ground.

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Note

Insert the cables through the cable glands on the enclosure before terminating and connecting them. In general, terminated connectors will not fit through the cable gland. If a terminated cable is required, it is possible to make a clean and singular cut in the gland seal to install the cable.

1.4.5 Connecting Power

The camera can be powered with a conventional Vac or Vdc power supply, rather than PoE+. Prior to making any connections, ensure the power supply or circuit breaker is switched off.

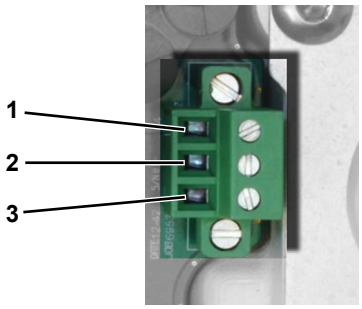
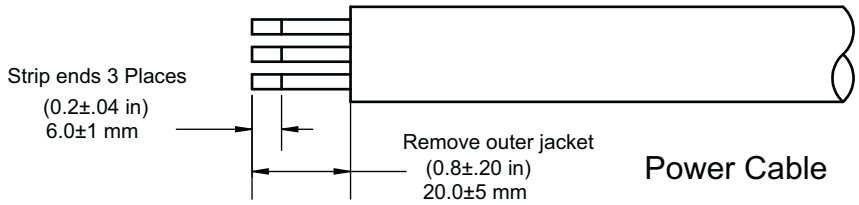


Table 1-2: Power Connections

1	Chassis
2	Vac1 or Vdc –
3	Vac2 or Vdc +

Figure 1-8: Power Connector

The power cable supplied by the installer must use wires that are sufficient size gauge for the supply voltage and length of the cable run to ensure adequate current carrying capacity (18 AWG recommended for most installations). Always follow local building/safety codes.



Note

The terminal connector for power connections will accept 16 AWG to 24 AWG wire size.

The power connector plug may be removed for cable installation. After the plug is reattached to the board, re-tighten the screw terminals.

The camera itself does not have an on/off switch. Generally, the FC-Series AI and FC-Series AI R cameras can be connected to a circuit breaker and the circuit breaker will be used to apply or remove power to the camera. If power is supplied to it, the camera will be powered on and operating.

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1.4.6 Alarm I/O Connections

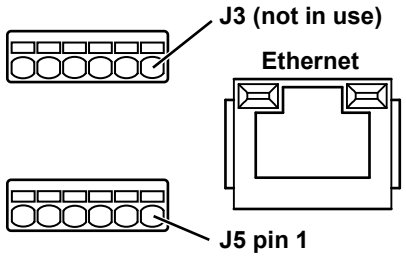


Figure 1-9: Alarm I/O and Ethernet Connectors

Input—When the camera senses an external switch closure that completes the circuit between J5 pins 4 and 5, an input signal is generated for alarm management. For information about how to configure alarms, see the user guide.

Output—Accessory connector J5 pins 2 and 3 connect to a switch in the camera to complete the circuit for the receiving device. When open, the resistance between pins 2 and 3 is greater than 100 K ohm. When closed, the resistance between pins 2 and 3 is less than 200 ohm. The maximum recommended peak voltage between the pins is 6 volts. The maximum recommended current allowed between the pins is 30 mA (0.03 A).

By default, the alarm I/O circuits are configured for normally open switches. For information about configuring an alarm for a normally closed switch, see the user guide.

The terminal plug supplied for alarm I/O connections can be either a fast-connect, spring-cage and pierce contact; or it can a push-in spring contact.

The push-in spring contact accepts 20 - 24 AWG conductors. Strip conductor ends to 6 mm.

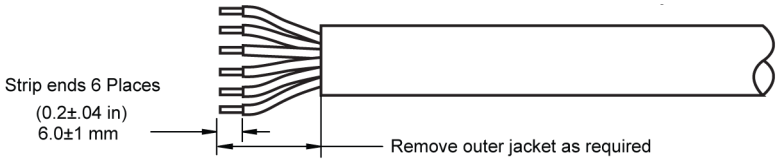


Figure 1-10: Alarm I/O Cable

The spring-cage and pierce contact accepts 22 AWG to 24 AWG, stranded conductors with a 1.6 mm maximum diameter including insulation. Do not strip insulation from conductors.

Table 1-3: Alarm I/O Connections - J5

Pin	Connection	Notes
1	Chassis ground	
2	Alarm out	When the camera sends an output signal, an external voltage on one pin is applied to the other pin.
3	Alarm out	
4	Alarm in (Digital ground)	When these pins are connected externally, the camera reads this as an input signal.
5	Alarm in (+5V)	
6	Chassis ground	

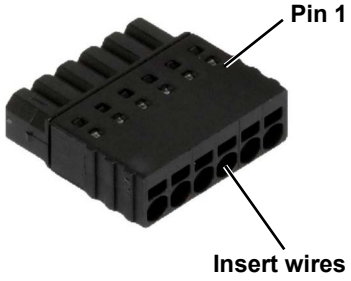


Figure 1-11: Six-Pin Terminal Plug (Push-In Spring Contact)

Caution!

J5 pins 4 and 5 must not be connected to outside voltages or power sources. Pin 5 must not be connected to chassis ground. While protection for static discharge has been placed on these pins, care should be used when making connections to avoid damage to the camera.

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1.4.7 Ethernet

Connect a shielded Cat5e or Cat6 Ethernet cable to the RJ45 connector. If using PoE+ to supply power to the camera, connect the other end of the cable to a PoE+ switch or PoE+ injector. Otherwise, connect the cable to a network switch.

1.4.8 Camera Grounding

The unit is intended for outdoor installation. Ensure the camera is properly grounded. Failure to properly ground the camera can permanently damage the camera.

Permanently connect the ground stud on the back of the camera to PE (protective earth) using a 12 AWG ($4mm^2$) PE conductor. A skilled individual is required to install a PE conductor to the ground of the building.

If, during installation, you disconnect any ground connections inside the camera, reconnect them prior to closing the camera.

1.4.9 Rear Access Cable Gland Sealing

Proper installation of cable sealing gland and use of appropriate elastomer inserts is critical to long-term reliability. Cables enter the rear of the camera mount enclosure through a liquid-tight compression gland.

Table 1-3: Rear Exit Cable Min/Max Dimensions

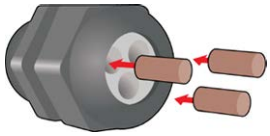
Cable	Min	Max
Power (three-conductor), Ethernet, accessory cables	4.5 mm [0.178 in]	5.2 mm [0.205 in]
RG 59 video cable	5.3 mm [0.209 in]	6.2 mm [0.244 in]

Leave the gland nut loosened until all cable installation has been completed, and ensure the manufacturer's recommended cable bend radius is observed within the enclosure. Do not forget to tighten the cable gland seal nut to ensure a watertight seal and provide strain relief for cables.

Cable Gland Seal Inserts

The FC-Series AI camera is shipped with a single 3/4" NPT cable gland attached. The gland includes a sealing washer and is secured to the camera with nuts on the inside and on the outside of the enclosure. A gland seal insert provides four holes for Ethernet, power, alarm I/O, and RG-59/U analog video cables. Route cables through the holes so that they line up with the corresponding connectors inside the camera.

Plug any hole not used for cables with one of the supplied hole plugs.



Note

Insert the cables through the cable glands on the enclosure before terminating and connecting them. In general, terminated connectors will not fit through the cable gland. If a terminated cable is required, make a clean and singular cut in the gland seal to install the cable into the gland seal.

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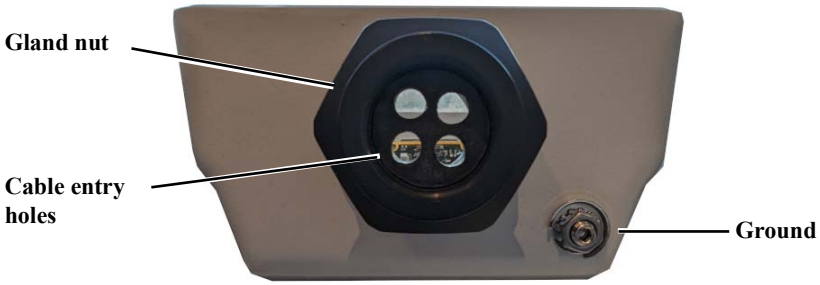


Figure 1-12: Cable Routing

To ensure a water tight seal when using the supplied rear cable gland, cable dimensions must be within the minimum and maximum as described in Table 1-3.

1.5 Concealed Cable Mount Accessory

Do not route cables through the bottom of the camera unless the concealed cable wall mount (PN 4129742) is used. The wall mount is specifically designed for the camera and allows the opening to seal properly. When using the concealed cable wall mount, cable dimensions must be within the minimum and maximum as described in Table 1-4.

Table 1-4: Cable Min/Max Dimensions using Concealed Cable Wall Mount (PN 4129742)

Cable	Min	Max
Power (three conductor), Ethernet, alarm I/O cables	4.5 mm [0.178 in]	10 mm [0.394 in]
RG 59 video cable	5.3 mm [0.209 in]	10 mm [0.394 in]

Proper installation of the seal plate and panel mount gland seals is critical to long-term reliability. Cables enter the bottom of the camera enclosure through the seal plate and panel mount glands. Be sure to insert each cable through its panel mount gland on the seal plate before terminating them (connectors will not fit through the gland). Ensure the manufacturer's recommended cable bend radius is not exceeded within the enclosure.

Mount the Camera Using the Concealed Cable Wall Mount

Step 1 Use a 3 mm hex key to loosen the four captive screws and remove the top cover as described above.

Step 2 Remove the rear cable gland and replace it with the cable gland plug. You will use the gasket and nut that were removed with the cable gland.



Figure 1-13: Removed Parts

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Step 3 Use a 3 mm hex key to loosen the four captive screws and remove the seal plate, o-ring, and plug.

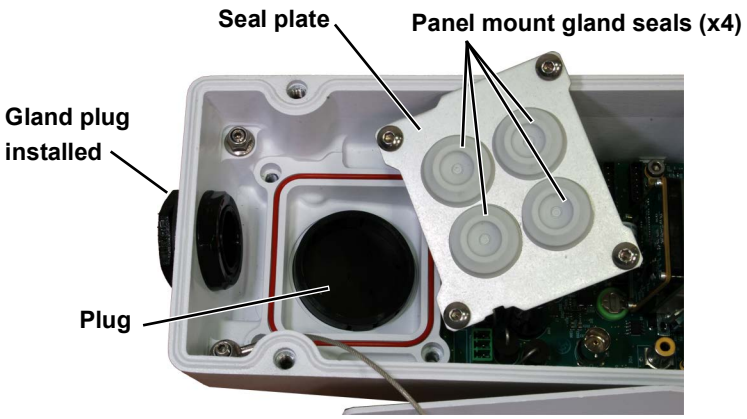


Figure 1-14: Seal Plate Removed

Step 4 Using four M5 x 16mm screws, attach the wall mount to the wall, and then pull the cable(s) through the mount. Cut a small cross-slit in the black mount gasket and push the cable(s) through the gasket. Pull the cable(s) through the opening in the bottom of the camera. A single Ethernet cable is shown in the images.

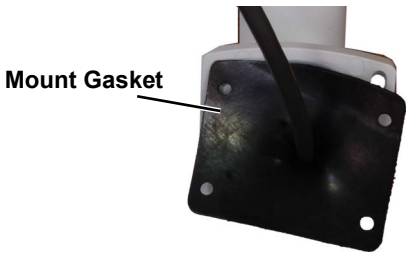


Figure 1-15: Camera Mount

Step 5 Secure the camera to the mount using the four M5 x 0.8 threaded fasteners on the bottom of the camera. Use Loctite 222 low strength thread locker for the mount fasteners.

Step 6 As needed, clean the o-ring and the o-ring groove in the bottom of the camera using isotropy alcohol and press the o-ring into its groove.

Step 7 For each cable, punch a hole in the center of a gland seal from the top using the 3 mm hex key. Insert the cable from the bottom though the hole.



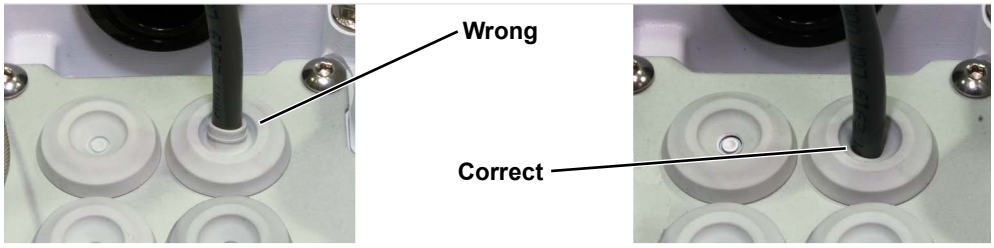
Figure 1-16: Cable through Seal Plate

Step 8 Place the gland plate back into position and tighten the four 3 mm captive screws using a torque value of 1.8 n-m (16.0 in-lbs).

Step 9 Check the length of each cable to ensure an appropriate bend radius and terminate the cable. Connect the cables as indicated in FC-Series AI Camera Connectors, pg. 8.

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Step 10 Push the cable back through the gland seal so that the seal extends down not up, as shown in the illustration below.



Caution!

When replacing the cover, make sure the ground wire between the cover and the camera body is completely inside the o-ring groove. If the wire is pinched between the cover and the base, the camera will not be sealed against water ingress and could be damaged.

Step 11 Ensure that any ground wire that was removed during installation is reconnected. Replace the cover and tighten the four 3 mm hex screws to 1.8 n-m (16.0 in-lbs).

Step 12 Using the hex key included with the concealed cable mount, loosen the ball joint on the bottom of the mount, position the camera as required, and then re-tighten the ball joint.

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1.6 Camera Specifications

Thermal Sensor & Optics	Array Format	640 x 512 (17 µm pixel pitch)
	Detector Type	Long-life, uncooled VOx Microbolometer
	Spectral Range	7.5 to 13.5 µm
	Focus	Athermalized, focus-free
	Sensitivity	AI models: <25 mK @ 25°C (77°F) for f/1.0
		AI - R models: <35mK @ 25°C (77°F) for f/1.0
	Model	**Field Of View (Focal Length - F/#)**
	FC-669 - AI & FC-669 - AI - R	69° × 56° (9 mm - F1.4)
	FC-690 - AI	90° × 69° (7.5 mm - F1.2)
	FC-632 - AI	32° × 26° (19 mm - F1.0)
	FC-610 - AI	10° × 8.2° (60 mm - F1.2)
	FC-608 - AI	8.6° × 6.6° (75 mm - F1.1)
	FC-644 - AI & FC-644 - AI - R	44° × 36° (13 mm - F1.0)
	FC-625 - AI & FC-625 - AI - R	25° x 20° (25 mm - F1.1)
	FC-617 - AI & FC-617 - AI - R	17° × 14° (35 mm - F1.1)
Temperature Measurement (AI - R models only)	Measurement Accuracy	Target below 100°C (212°F): ± 5°C (±9°F) accuracy Target below 150°C (302°F): ± 5% accuracy Target above 150°C (302°F): ± 15% accuracy Measured at 25°C ambient temperature. Inaccuracy can be greater at extreme temperatures.
	Object Temperature Range	High Gain Mode: 0°C to +160°C (32°F to 320°F) Low Gain Mode: 0°C to +380°C (32°F to 716°F)
Video	Composite Video	Hybrid system with IP & analog video, dynamic NTSC or PAL settings—switchable using DNA or the camera's web page
	Analog Video Output	1Vp-p (PAL or NTSC), 1 x BNC 75 Ω
	Video Compression	Two independent channels of H.264 / H.265, or M-JPEG
	Streaming Resolution	640 × 512 VGA 320 × 256 QVGA
	Thermal Image Settings	Auto AGC, Brightness, Contrast, Sharpness, Gamma, Smart Screen Optimization
	Thermal AGC Region of Interest (ROI)	Default, presets, and user definable to ensure optimal image quality on subjects of interest
	Analytics Management	Web-based configuration and management; masking of analytic detection areas, adjustable sensitivity, automatic responses, remote I/O control
	Analytics Features	Region entrance/intrusion detection, crossover/fence trespassing, CNN classifier
	Image Uniformity Optimization	Automatic flat-field correction (FFC) - thermal and temporal triggers
	microSD Card Snapshot Capture	Support up to 512 GB (sold separately)
System Integration	Ethernet	10/100 Mbps
	External Analytics Compatible	Yes
	Control Input/Output Network	1x dry contact in; 1x relay out (rated load 0.025 A@ 5 VDC)
	APIs	NEXUS SDK; NEXUS CGI; ONVIF Profiles S, G, T
Network	Supported protocols	IPV4, HTTP, HTTPS, UPnP, DNS, NTP, RTSP, TCP, UDP, ICMP, IGMP, DHCP, ARP, IEEE 802.1X

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<table>
<tr><td rowspan="8">General</td><td rowspan="3">Weight with Sunshield</td><td>2.2 kg (4.75 lb): all models except
FC-610 - AI
FC-608 - AI</td></tr>
<tr><td>FC-610 - AI : 2.4 kg (5.25 lb)</td></tr>
<tr><td>FC-608 - AI : 2.5 kg (5.5 lb)</td></tr>
<tr><td rowspan="3">Weight without Sunshield</td><td>1.8 kg (4 lb): all models except
FC-610 - AI
FC-608 - AI</td></tr>
<tr><td>FC-610 - AI : 2.0 kg (4.5 lb)</td></tr>
<tr><td>FC-608 - AI : 2.2 kg (4.75 lb)</td></tr>
<tr><td>Dimensions (L x W x H)</td><td>With sunshield: 282 × 129 × 115 mm / 11.1 × 5.1 × 4.5 in
Without sunshield: 259 × 114 × 106 mm / 10.2 × 4.5 × 4.2 in</td></tr>
<tr><td>Input Voltage and Power Consumption</td><td><table><tr><th>Source</th><th>Heater off</th><th>Heater on @ 100%</th></tr><tr><td>PoE+ IEEE 802.3at
54 Vdc ⎓ 0.55A</td><td><9 W</td><td><25 W</td></tr><tr><td>12 Vdc ⎓ 2.5A</td><td><10 W</td><td><28 W</td></tr><tr><td>24 Vdc ⎓ 1.25A</td><td><9 W</td><td><25 W</td></tr><tr><td>24 Vac 50/60 Hz 1.5A</td><td><15 W</td><td>< 32W</td></tr></table></td></tr>
<tr><td>Immunity</td><td>ESD: EN 61000-4-2
RS: EN 61000-4-3; EN 55035 (2017 + A11: 2020); EN 50130-4
EFT: EN 61000-4-4
Surge: EN 61000-4-5
CS: EN 61000-4-6
PFMF: EN 61000-4-8</td></tr>
<tr><td>Cybersecurity</td><td>IEEE 802.1X; TLS / HTTPS; user authentication; access control via firewall; user credentials with policy enforcement; digest authentication</td></tr>
<tr><td rowspan="8">Environmental</td><td>IP Rating
(Dust & Water Ingress)</td><td>IP67</td></tr>
<tr><td>Operating Temperature Range & Humidity</td><td>-40°C to 70°C (-40°F to 158°F), cold start; 0-90% relative humidity</td></tr>
<tr><td>Storage Temperature Range & Humidity</td><td>-50 °C to 85 °C (-58 °F to 185 °F); 0-95% relative humidity</td></tr>
<tr><td>Shock (Operational)</td><td>MIL-STD-810G, Method 516.6</td></tr>
<tr><td>Shock (Transportation)</td><td>IEC 60068-2-27:08</td></tr>
<tr><td>Vibration</td><td>IEC 60068-2-64:08</td></tr>
<tr><td>Vandalism</td><td>IK10 (except lens and windows)</td></tr>
<tr><td>De-icing / Anti-icing</td><td>MIL-STD 810F:00 + Notice 1:00 + Notice 2:02 + Notice 3:03</td></tr>
<tr><td rowspan="4">Warranty & Regulatory</td><td>Emission</td><td>FCC 47 CFR Part 15, Subpart B, Class A (within CISPR 22:2008 Class A limits); EN55032 Class A</td></tr>
<tr><td>Safety</td><td>IEC 62638-1:2018</td></tr>
<tr><td>Compliance</td><td>CE Marked
RoHS III Directive 2015/863/EU
WEEE Directive 2012/19/EU</td></tr>
<tr><td>Warranty</td><td>Camera: 3 years / Sensor: 10 years</td></tr>
</table>

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FC-Series AI Installation Guide
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