

Installation and User Guide

Elara™ R-Series Radar



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This device complies with part 15 of the FCC Rules and ISED's license-exempt RSSs. 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.

L'appareil est conforme à la section 15 des règles de la FCC et aux RSS exempts de licence de ISED. Le fonctionnement de l'appareil est soumis aux conditions suivantes: (1) Il ne doit pas causer d'interférences nuisibles, and (2) il peut accepter toute interférence, y compris celle susceptible de provoquer un fonctionnement indésirable de l'appareil.

This equipment complies with FCC radiation exposure limits and Canada radiation RF exposure limits set forth in CFR 47 Section 2.1091 and ISED RSS-102 set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the user and/or bystanders and this device. This device must not be co-located or operating in conjunction with any other antenna or transmitter, unless permitted under existing FCC certification condition.

Cet appareil est conforme aux limites d'exposition aux rayonnements de la FCC et aux limites d'exposition aux RF du Canada établies dans le CFR 47, section 2.1091 et ISED RSS-102 pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre l'utilisateur et / ou des tiers et cet appareil. Cet appareil ne doit pas être co-localisé ou fonctionner en conjonction avec une autre antenne ou un autre émetteur.

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.

Avis d'Industrie Canada:

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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
100	September 2021	Initial Teledyne FLIR release
110	March 2023	GA release

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1 Radar Overview

The Elara R-Series Radar is a perimeter security radar that supplements PTZ camera installations. Multiple simultaneous target tracking and superior performance in poor environmental conditions make the Elara R-Series Radar a critical component for complete security solutions. It features inclusion and exclusion (masking) zone configuration.

When the radar is connected to an IP network, it functions as a server, providing services such as network communications. The server uses an open, standards-based communication protocol to communicate with FLIR and third-party video management system (VMS) clients, including systems that are compatible with ONVIF¹.

If help is needed during the installation process, contact the local Teledyne FLIR service representative or call the appropriate support number that appears on the product's page at <https://support.flir.com/>. All installers and integrators are encouraged to take advantage of the training offered by Teledyne FLIR; visit <https://www.teledyneflir.com/support-center/training/> for more information.

For safety, and to achieve the highest levels of performance from the Elara R-Series Radar, always follow the warnings and cautions in this manual when handling and operating it.

Warning!



Before drilling into surfaces for mounting, verify that electrical or other utility service lines are not present. Serious injury or death may result from failure to heed this warning.

Caution!

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

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

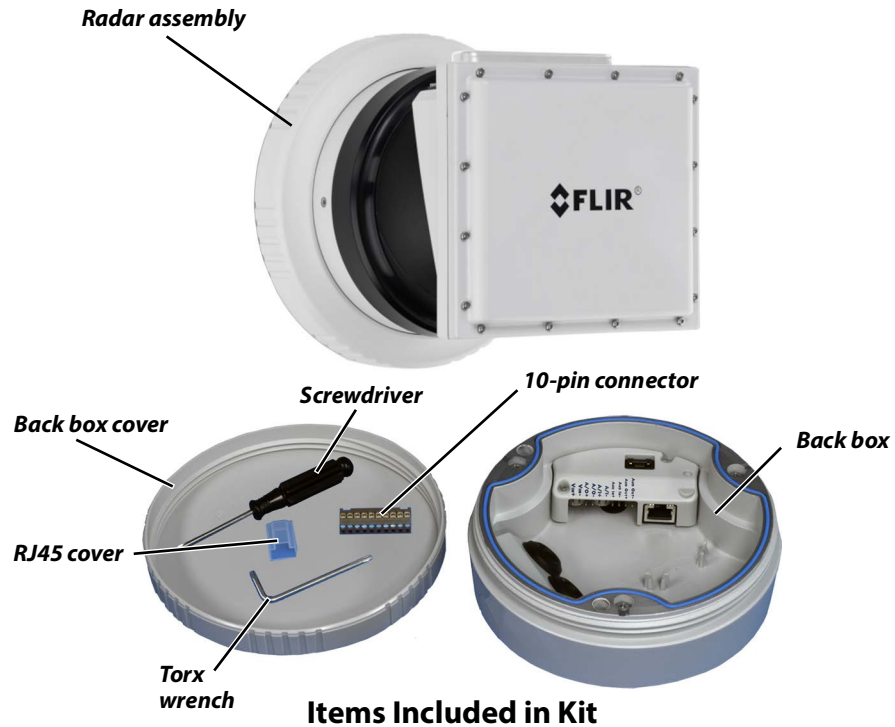
Operating the Elara R-Series Radar outside of the specified input voltage range or the specified operating temperature range can cause permanent damage.

No user serviceable components are inside.

1. ONVIF is a trademark of Onvif, Inc.

1.1 Supplied Components

The Elara R-Series Radar kit includes the following components:



1.2 Additional Supplies

The installer might need to supply the following items as required (specific to the installation).

- Power over Ethernet (PoE) injector or switch for radar power.
- Cat5e or Cat6 Ethernet cable for IP communication and PoE.
- Ten-conductor accessory cable for auxiliary power.
- Radar grounding strap, radar mount, electrical hardware, connectors, and tools.

1.3 Elara R-Series Radar Specifications

		R-290 (USA / FCC)	R-190 (Europe / CE)	
Performance	Field of View (H x V)	90° x 20°		
	Frequency Range	24.075-24.175 GHz ISM Band	24.000-24.250 GHz ISM Band	
	RF Transmit Power	14dBm (0.025W)	6dBm (0.005W)	
	Human Detection Range	200 m (656 ft)	125 m (410 ft)	
	Vehicle Detection Range	400 m (1312 ft)	300 m (984 ft)	
	Target Detection Speed	0.2 m/sec		
	Radar Targets	32		
	Range Resolution	1.5 m	0.6 m	
	Range Accuracy	<1 m		
	Angular Accuracy	0.6°		
	Refresh Rate	10 Hz		
	Coverage Area	Human Detection	7.6 acres (30,000 m ²)	3 acres (12,000 m ²)
	Target Information	GPS coordinates, velocity, RCS, range, azimuth angle / direction, heading, course / track, target ID		
	Supported Protocols	AXML, ONVIF, FLIR Nexus SDK, FLIR Nexus CGI		
Interface	Connector Types	RJ45 Ethernet, Power Terminal Block		
	Connectivity	10/100 Ethernet		
Mechanical	Weight	2.4 kg / 5.3 lb		
	Height	161 mm / 6.34 in		
	Width	161 mm / 6.34 in		
	Depth	195 mm / 7.68 in		
	Pan Range	+/- 43°		
	Tilt Range	+30° / -60°		
	Box Contents	Radar assembly, back box, back box cover, wall mount plate, RJ45 cover, screwdriver, hex wrench, 10-pin I/O connector		
	Optional Accessories	421-0067-00: Pole Mount Kit 421-0066-00: Corner Mount Kit 421-0083-00: 180° Dual Radar Wall Mount Kit T911183: Gigabit PoE injector 16W		
Environmental	Operating Temperature	-40°C to 70°C (-40°F to 158°F)		
	Non-operating Temp	-50°C to 85°C (-58°F to 185°F)		
	IP Rating	IP66		
Power	Input Voltage	12V DC, 24V AC, and PoE (IEEE 802.3af)		
	Power Consumption	<13W		

2 Installation

Installing the Elara R-Series Radar consists of:

- Step 1 [Configuring the Radar for Networking](#)
- Step 2 [Radar Placement and Orientation](#)
- Step 3 [Site Preparation](#)
- Step 4 [Attaching the Mounting Bracket](#)
- Step 5 [Connecting the Radar and Installing the Back Box](#)
- Step 6 [Installing the Radar Assembly](#)
- Step 7 [Uploading a Map Image and Configuring Georeference Settings](#)
- Step 8 [Aiming the Radar and Testing Target Detection](#)
- Step 9 [Defining Alarm and Exclusion Regions](#)
- Step 10 [Pairing an R-Series Radar with a FLIR Security PTZ Camera \(Optional\)](#)

2.1 Configuring the Radar for Networking

You can configure the radar for networking before or after mounting it.

By default, Dynamic Host Configuration Protocol (DHCP) is enabled on the radar and a DHCP server on your network assigns the radar an IP address. If there is no DHCP server on the network, the radar's IP address defaults to 192.168.0.250 and the netmask defaults to 255.255.255.0. You can specify another IP address for the radar and configure it for networking using the FLIR Discovery Network Assistant (DNA) software tool, version 2.3.0.20 or higher; the radar's web page; or a supported VMS.

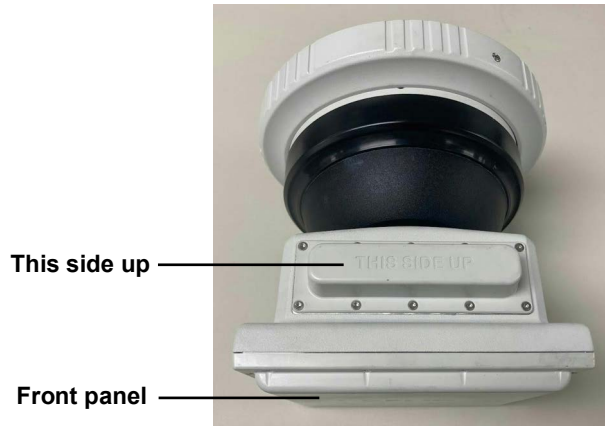
	DNA tool	Radar's web page
Discover radar IP address	•	
Configure IP address, mask, and gateway	•	•
Configure DNS settings and MTU		•
Configure more than one radar at the same time	•	

For information about using a supported VMS to configure one or more radars at the same time, see the VMS documentation.

To connect the radar and configure it for networking before mounting it:

- Step 1 The radar assembly and the back box are shipped in separate boxes. Remove the radar assembly from its shipping box and place it on a table, desk, or other flat surface. Make sure the THIS SIDE UP marking on the radar assembly faces up.

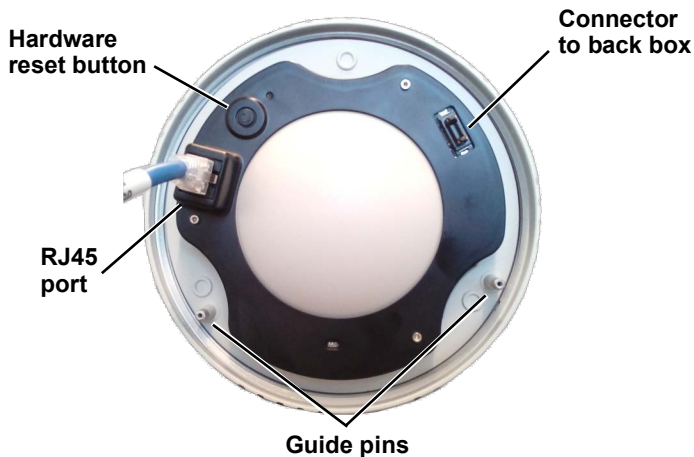
Installation



Important

Do not provide power to the radar when it is resting on its flat front panel or with it pointing at metallic surfaces that are closer than one meter away.

- Step 2 Using a PoE injector or switch, connect an Ethernet cable to the RJ45 port on the radar assembly's back panel.



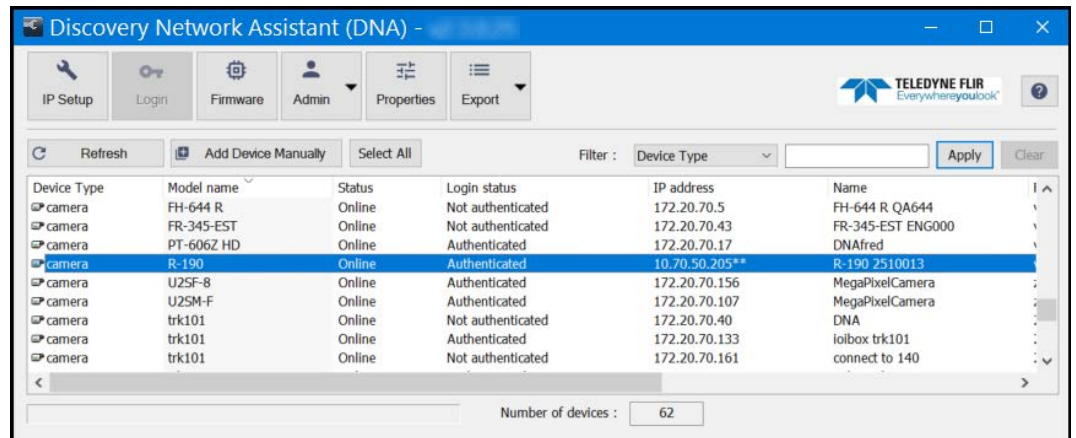
Make sure the PC and the radar are on the same network.

To configure the Elara R-Series Radar for networking using the DNA tool:

- Step 1 In the DNA tool, double-click the radar in the Discover List. Identify the radar by model name (R-x90) and name. The default name is R-x90 followed by the radar's serial number.

The DNA tool does not require a license to use and is a free download from the product page on the Teledyne FLIR website (<https://www.teledyneflir.com>). Download the DNA tool; unzip the file; and then double-click  to run the tool (DNA.exe). The Discover List appears, showing compatible devices on the VLAN and their current IP addresses.

Installation

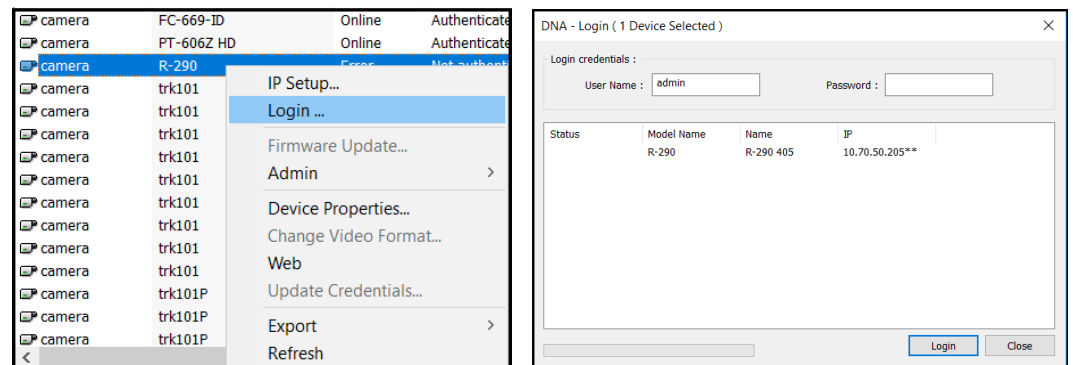


DNA Discover List - R-190 Authenticated and Manually Added **

Step 2 Authenticate the radar.

Right-click the radar and select **Login**, or click the **Login** icon in the navigation bar.

In the **DNA - Login** window, type the password for the admin user (default: *admin*). Then, click **Login**.



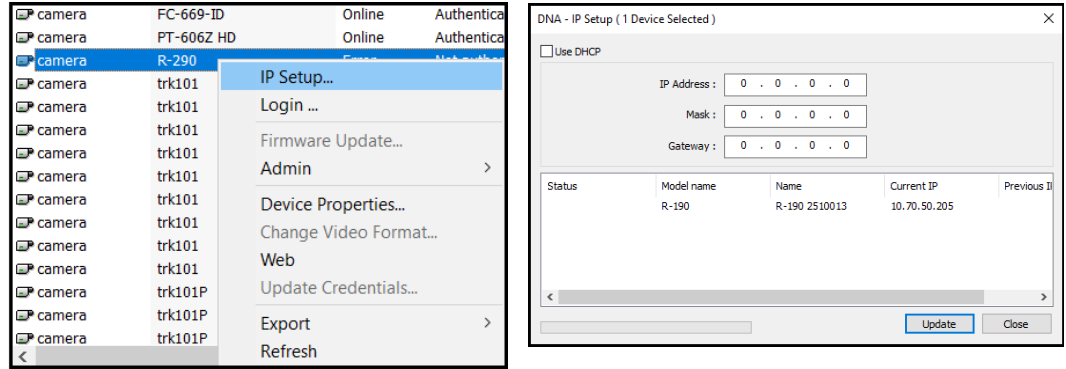
In the DNA Discover List, verify that the radar's status is *Online* and *Authenticated*.

Step 3 Configure the radar's networking settings.

Right-click the radar and select **IP Setup**, or click the **IP Setup** icon in the navigation bar.

In the **DNA - IP Setup** window, you can clear *Use DHCP* and manually specify the radar's *IP Address*, *Mask*, and *Gateway*. Then, click **Update** and wait for **Ok** status to appear.

Installation



To manually specify the radar's IP address using the radar's web page:

- Step 1 Log into the radar's web page; see [Accessing the Radar](#).
- Step 2 On the [View Settings Home Page](#), click **System Settings**, and make sure the [Network Page](#) appears.
- Step 3 Click **Static** IP addressing and then manually specify the radar's *Hostname*, *IP address*, *Netmask*, and *Gateway*.

You can also specify the *DNS Mode*, *Name Servers*, and *MTU* (maximum transmission unit).
- Step 4 Click **Save**. Applying any changes on the Network page requires rebooting the radar.

2.2 Radar Placement and Orientation

The Elara R-Series Radar is designed for outdoor security applications. Typically, the radar faces out from the perimeter it is protecting. The following factors determine the optimal location:

- Unobstructed line of sight to the area under surveillance
- Radar height above ground
- Proximity to large metallic radar-reflective objects such as buildings, trucks, or aircraft
- Power and connectivity availability

If possible, mount the radar where it has an unobstructed view of the area to be monitored. If a fully unobstructed line of sight is not possible, select a mounting location that maximizes the unobstructed area the radar can monitor. For example, the radar signal does not penetrate through foliage or vegetation. If present, select a mounting location that minimizes the impact. To cover blind spots, you can install one or more additional radars.

Teledyne FLIR recommends installing the Elara R-Series Radar at a height of approximately 4 m (13 ft) and so that the radar assembly is horizontally level; that is, with the front panel at a 90° vertical angle to the ground. However, it is also important to point the radar at an angle parallel to the general slope of the terrain under surveillance. If you are not mounting the radar so that the radar assembly is horizontally level, make sure to specify the radar's pitch, or installation tilt, angle and roll angle while configuring the radar.

Installation

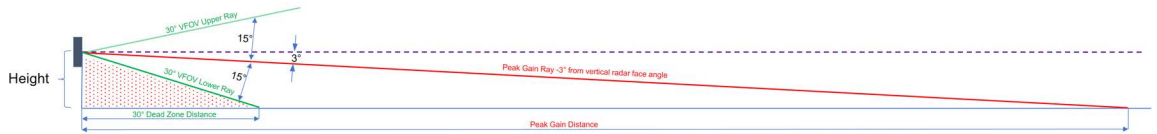
Also consider seasonal vegetation changes and potential obstruction from ground vehicles, such as cars, trucks, and aircraft, that can change over time.

Important

In addition to the above considerations:

- **Any building wall or solid surface in the radar's field of view acts as a mirror for the radar signal.** As such, there shouldn't be any large metallic objects or structures in front of the radar within the first 100 meters (330 ft) over a 90° azimuth sector, nor any large non-metallic objects or structures within the first 50 meters (165 ft).
- The radar should also face away from walls or fences that can cause reflections.

Peak gain for the radar signal is at -3° ; that is, slightly below horizontal. The following graph illustrates the radar's signal to consider when determining where and how to mount it. To open a larger graph in a web browser, click the graph.



Radar Signal - Aimed Horizontally Level over Flat Ground

For optimum detection, locate and aim the radar so that the farthest targets coincide with the peak gain ray; that is, the peak gain distance. To improve detection of closer targets, you can aim the radar lower, at the expense of detecting targets further away.

The following table shows the radar's close target detection limit for a human 1.8 m (6 ft) tall and where the radar's peak gain contacts the ground at different installation heights.

Installation height	Close target detection limit (1.8m / 6' human)	Peak gain ground intersection
3 m (10 ft)	6 m (20 ft)	58 m (190 ft)
4 m (13 ft)	10 m (33 ft)	77 m (253 ft)
5 m (16 ft)	14 m (46 ft)	96 m (315 ft)

To provide full radar coverage for a sector, the fields of view of two or more radars might overlap. After you configure them so that their radar frequencies do not interfere with each other on the [Radar Page](#), you can configure an Elara R-Series Radar to fuse tracking information from one or more other Elara R-Series Radars with its own tracking information; see the [Radar Settings Page](#). With accurate georeference information configured, the radar performing the fusion can determine whether it and a fused radar are tracking the same object; see [Uploading a Map Image and Configuring Georeference Settings](#).

You can mount the radar onto a standard electrical box; directly to a secure, flush, and vibration-free surface; or using appropriate mounting hardware. Teledyne FLIR offers accessories to mount the radar in a corner, on a pole, or on a wall. For information, see the *FLIR Security Fixed Mount Solutions Accessory Guide*.

Be sure to have the required accessories and tools available.

If required, install the mounting hardware for the radar according to the instructions for the hardware. Route the power and network cables so that they are accessible when mounting the radar.

Installation

Regarding orientation, note the following:

- The two guide pins on the radar assembly that fit only one way into the corresponding holes on the back box.
- There are three possible ways to secure the back box onto the wall mount bracket. However, only one way allows you to route a conduit into the side opening of the back box and cable from the conduit through the grommets, for surface mounting.
- The text stamped on the inside of the wall mount bracket that indicates the appropriate screw holes for different types of electrical boxes.
- The THIS SIDE UP marking and the FLIR logo on the radar assembly.
- If you are mounting the radar so that its face is vertical and want to verify it, use a bubble level.

Note

While it is possible to install the wall mount bracket so that the text on the inside of the wall mount bracket is not upright, when you aim the radar, make sure the THIS SIDE UP marking on the radar assembly faces up, the FLIR logo on the flat front panel is upright, and that the top of the radar panel is horizontally level.

2.3 Site Preparation

The following recommendations provide for proper installation and operation of the radar. Adhere to all local and industry standards, codes, and best practices.

- **Ambient Environment Conditions:** Avoid positioning the radar near heaters or heating system outputs.
- **Safety:** Cables and electrical cords should be routed in a manner that prevents safety hazards. Ensure that nothing rests on the radar's cables or power cords.
- **Ample Air Circulation:** Leave enough space around the radar to allow free air circulation.
- **Physical Security:** The radar provides threat detection for physical security systems. In order to ensure that the radar cannot be disabled or tampered with, the system should be installed with security measures regarding physical access by trusted and untrusted parties.
- **Network Security:** The radar transmits over IP to security personnel for video surveillance. Proper network security measures should be in place to assure networks remain operating and free from malicious interference. Install the radar on the backbone of a trusted network.
- **Electrostatic Discharge Safeguards:** The radar and other equipment connected to it (relay outputs, alarm inputs, racks, carpeting, etc.) shall be properly grounded to prevent electrostatic discharge.

2.4 Attaching the Mounting Bracket

You can attach the mounting bracket to a standard electrical box; directly to a secure, flush, and vibration-free surface; to appropriate mounting hardware. For information about attaching it to mounting hardware, see the hardware's instructions.



Wall mount bracket



Twist-lock screws in back box

- Step 1 Remove the back box cover by unscrewing it from the back box.
- Step 2 The mounting bracket is shipped attached to the back box. Using the screwdriver, unscrew the three quarter-turn twist-lock screws to release the bracket.

To attach the mounting bracket to a standard electrical box, use:

- The holes in the mounting bracket, according to the types of boxes engraved on the bracket
- The corresponding holes in the box
- Suitable bolts, washers, and nuts (not included in the radar kit)

To attach the mounting bracket directly to a surface:

- Step 1 Choose four widely spaced mounting holes on the bracket for optimum flat surface mounting.
- Step 2 Using the bracket as a template to mark the surface, drill four anchor holes.
- Step 3 (Optional) If necessary, also drill a hole wide enough through which to route the cables.
- Step 4 Hammer the four plastic screw anchors into the drilled holes.
- Step 5 Insert the anchors and then attach the bracket to the surface using the four M4 25mm self-tapping screws included in the radar kit.

When tightening the screws, the holes in the mounting plate allow for making small adjustments to the bracket's position.

- Step 6 (Optional) If you are routing cables to the radar using a conduit, route the conduit to the bottom edge of the mounting bracket, so that you can attach the conduit to the conduit entry hole on the back box. Use the Torx wrench to remove the conduit hole cover.

Installation

2.5 Connecting the Radar and Installing the Back Box

When mounted, all of the radar's connections are made inside the back box. The radar assembly plugs into the back box.

Power

The radar can be powered by 12 VDC; 24 VAC; or PoE—for example, Teledyne FLIR part number #T911183 16W Gigabit multi-plug PoE injector. Power consumption is <13W. The Elara R-Series Radar is a Powered Device compliant with the IEEE 802.3af-2003 standard. The maximum Ethernet cable run is 100 meters, including the PoE power supply.

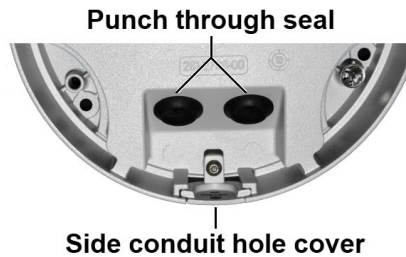
Installations using PoE require only a single Ethernet cable connection.

Grounding

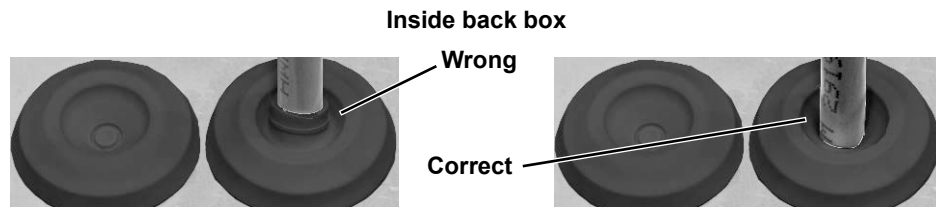
Ensure the radar is properly grounded. Failure to properly ground it can lead to permanent damage to the radar. Typical to good grounding practices, the radar back box chassis ground should be connected to the lowest resistance path possible.

To connect the Elara R-Series Radar and install the back box:

- Step 1 Ensure the power supply or circuit breaker is off.
- Step 2 Route cables through the hole in the mounting bracket or through the conduit.
- Step 3 For each cable, use the Torx wrench to punch a hole in the center of a cable gland seal from the underside. Insert the cable through the hole.



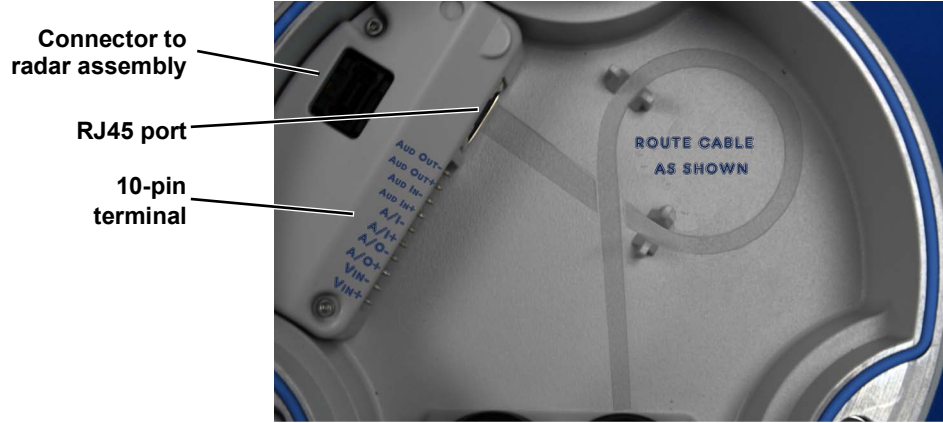
- Step 4 Insert the cable through gland seals, before terminating or connecting it. Failure to do so compromises the cable gland's waterproof integrity.
- Step 5 Push the cable back through the seal so the seal points out of the back box.



- Step 6 Seal all exposed connections. Cable connections are not waterproof.

Installation

Step 7 Route the Ethernet cable inside the back box as shown.



Connector	Connection
RJ45 port	Attach a Cat5e or Cat6 cable from the network switch to the RJ45 port for 100/1000 Mbps Ethernet and PoE. Ethernet is required for configuring the radar and for streaming IP video from it.
10-pin terminal	If you are using a 12 VDC or 24 VAC external power supply, connect the wires to the appropriate pins on the 10-pin connector supplied with the radar kit. Then, plug the connector into the terminal.

10-Pin Terminal

Pin	Connection
VIN+	VAC / VDC +
VIN-	VAC / VDC -

Future release support			
A/O+	A/O-	A/I+	A/I-
AUD IN+	AUD IN-	AUD OUT+	AUD OUT-

Step 8 Secure the back box onto the wall mount bracket using the screwdriver to tighten the three quarter-turn twist-lock assemblies.

While it is possible to install the wall mount bracket so that the text on the inside of the wall mount bracket is not upright, when you aim the radar, make sure the THIS SIDE UP marking on the radar assembly faces up and the FLIR logo on the flat front panel is upright.

2.6 Installing the Radar Assembly

Step 1 Secure the radar assembly onto the back box using the guide pins on the radar assembly and the guide holes on the back box.

Installation

Make sure the THIS SIDE UP marking on the radar assembly faces up and the FLIR logo on the flat front panel is upright.

Teledyne FLIR recommends installing the radar so that the radar assembly is horizontally level. However, it is also important to point the radar at an angle parallel to the general slope of the terrain under surveillance. If you are not mounting the radar so that the radar assembly is horizontally level, make sure to specify the radar's pitch, or installation tilt, angle and roll angle while configuring the radar.



Important

When removing the radar assembly from the back box, take precautions to prevent it from becoming a drop hazard for persons or property.

- Step 2 Securely tighten the radar assembly's outer circular ring. Then, use the Torx wrench to securely tighten the set screw on the outer circular ring.
- Step 3 Make sure the radar assembly is pointed at the area under surveillance, but do not tighten the set screws.
- Step 4 Provide power to the radar. Wait one minute to allow the radar to fully power up, and then proceed.

Important

Do not provide power to the radar when it is resting on its flat front panel or with it pointing at any reflective surface closer than one meter away.

- Step 5 If you have not yet configured the radar for networking and would like to change the radar's default networking settings, proceed with [Configuring the Radar for Networking](#).

2.7 Uploading a Map Image and Configuring Georeference Settings

Users assign the admin or export role can upload a reference map image upon which the radar will overlay its display. Uploading and properly calibrating a map makes aiming the radar easier and also makes the radar display more useful to operators.

- Step 1 Access the radar by logging in to its web page. See [Accessing the Radar](#).
- Step 2 While in View Settings, open the [Radar Page](#). Under Radar Mode, click **On**.
- Step 3 Click **System Settings**, open the [Map Page](#), and then upload and calibrate a map image.
- Step 4 Click **Back to View Settings**, open the [Georeference Page](#), and specify the radar's georeference settings.

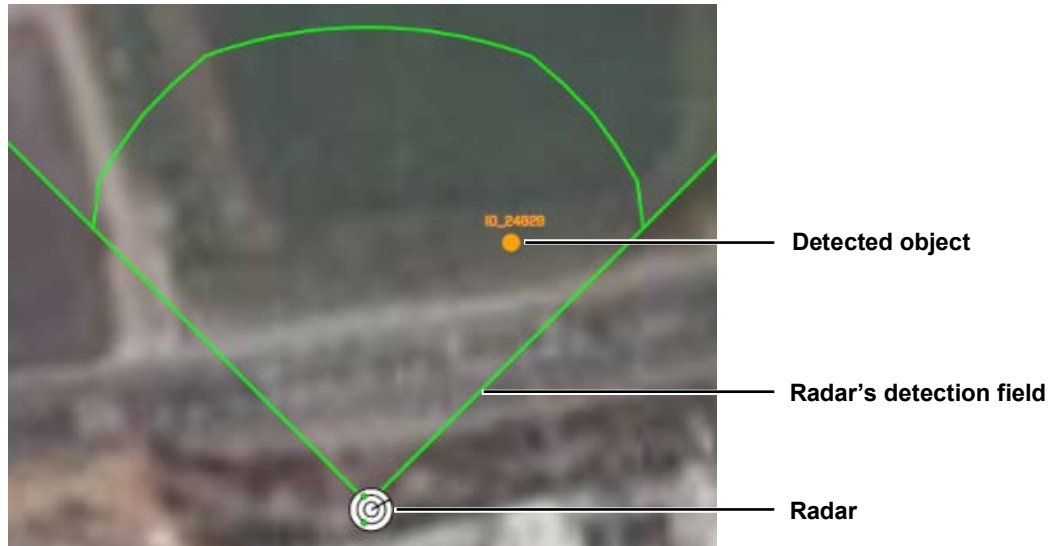
2.8 Aiming the Radar and Testing Target Detection

- Step 1 While viewing the radar's display in View Settings, aim the radar by manipulating the assembly to provide the desired detection field.

Installation

- Step 2 Have a person walk in a straight line directly away from and the back towards the radar, at or near a landmark identifiable on the map. Verify the detection track appears in the radar display and accurately appears on the map.

The following image shows a detected object on the radar display:



Orange detected objects—Outside a defined alarm area or have not crossed a tripwire.

Red detected objects—Inside a defined alarm area or have crossed a tripwire.

- Step 3 Tighten the two set screws and verify the radar's orientation setting.

2.9 Defining Alarm and Exclusion Regions

On the [Radar Page](#), define alarm and exclusion regions.

2.10 Pairing an R-Series Radar with a FLIR Security PTZ Camera (Optional)

By default, Elara R-Series Radars support geotracking. You can pair an Elara R-Series Radar with a FLIR Security PTZ camera that supports geotracking. The PTZ camera engages and tracks objects detected by the radar.

Visible Cameras	Multispectral Cameras	Thermal Cameras
Quasar 4K 22x IR-PTZ CP-6408-21-I	DM-Series	PT-Series HD
Quasar 4K 31x IR-PTZ CP-6408-31-I	DX-Series	

Pairing does not require configuration on the radar. However, geotracking does require accurate location information for both paired devices. For the radar, see [Georeference Page](#).

If there are significant elevation differences in the coverage area, you might need to upload a digital elevation model (DEM) file to the PTZ camera. For information about creating and uploading the DEM file, see the PTZ camera's documentation.

Installation

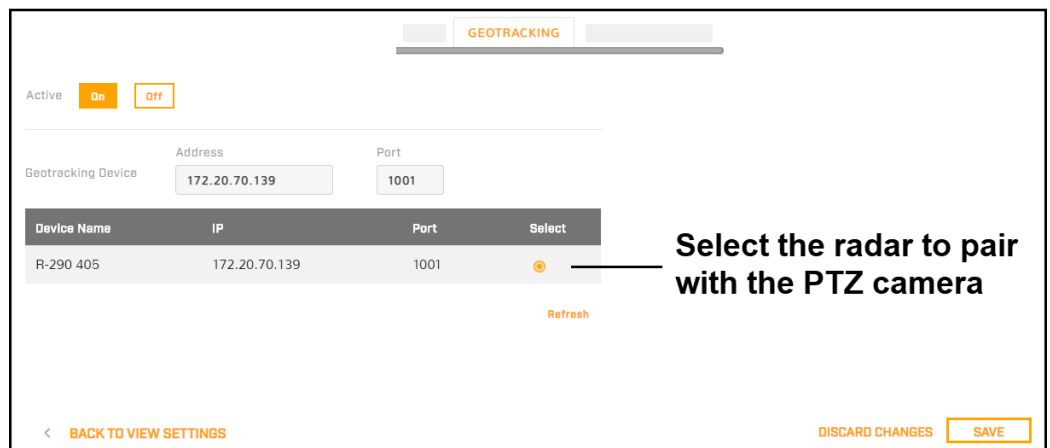
2.10.1 Pairing with a Quasar 4K IR-PTZ, DX-Series, or DM-Series Camera

To pair one of these PTZ cameras with an Elara R-Series Radar, a PTZ camera user assigned the expert or admin role can enable and configure geotracking using the PTZ camera's web page. The PTZ camera requires firmware v1.6.0.31 or later.

To enable the pairing on the camera:

- Step 1 Access the camera and log in to the camera's web page. For information about accessing the camera, see its installation and user guide.
- Step 2 Click **System Settings** and open the **Geotracking** tab.

A list of supported geotracking devices on the same LAN segment as the PTZ camera appears.
- Step 3 Enable geotracking by clicking **On**.
- Step 4 From the list of supported geotracking devices, select the radar to pair with the PTZ camera.



If the radar does not appear in the list, next to **Geotracking Device**, specify the radar's IP address and port 1001. Click **Save**. The radar appears in the list. Select it.

If one radar (X) is configured to fuse tracking information from another radar (Y), select radar X. For more information about fusing radars, see [Radar Settings Page](#).

Make sure the radar's IP address and port appears next to Geotracking Device.

- Step 5 Click **Save**. The camera reboots.

After the camera reboots, log back in to the camera's web page.

To enable and configure a geotracking mode on the PTZ camera:

- Step 1 From the View Settings menu, open the PTZ page.
- Step 2 Open **Advanced Settings**.

Installation

You can:

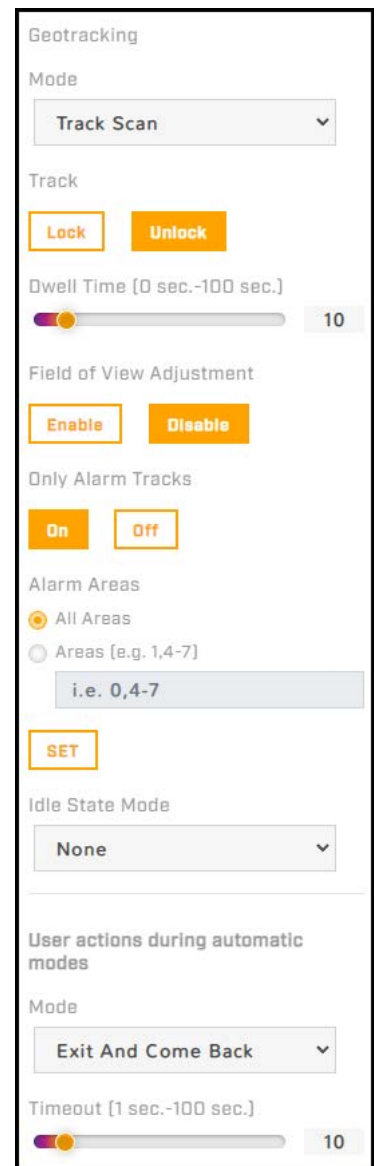
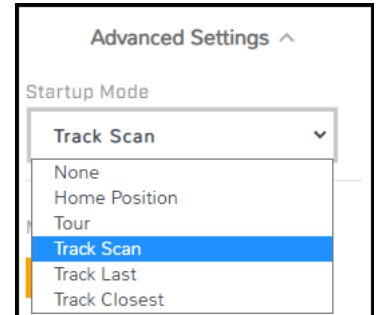
- Select one of the following geotracking startup modes / modes:
 - **Track Scan**—The camera performs a tour scanning all active geotracks. It follows each track for a specified dwell time.
 - **Track Last**—The camera follows the most recently detected geotrack.
 - **Track Closest**—The camera follows the geotrack closest to the camera.
- Test the pairing with the PTZ camera by keeping it locked onto the current track, regardless of the existing mode. Under Track, click **Lock**.

As long as the radar detects the object and provides the geotracking information, the camera follows the track. When the radar no longer detects the object, the camera automatically changes the setting to **Unlock**.

- Specify a Dwell Time, between 0-100 seconds. In Track Scan geotracking mode, the camera stays on each geotrack for the specified dwell time.
- Enable Field of View Adjustment. The distance from the radar to a tracked object determines the PTZ camera's zoom. Specify the PTZ camera's field of view (FoV), between 1-100 meters.
- Enable Only Alarm Tracks. The PTZ camera only tracks objects detected by the radar in an alarm region. Select:
 - **All Areas**—The PTZ camera tracks objects detected in all alarm regions.
 - **Areas**—The PTZ camera tracks objects detected in specified alarm regions. To specify specific regions and ranges of regions, you can use a comma. For example, you can specify 0, 4-7.

Click **Set**.

- Specify the Idle State Mode, the behavior of the PTZ camera when it is in a geotracking mode and there is no track to engage:

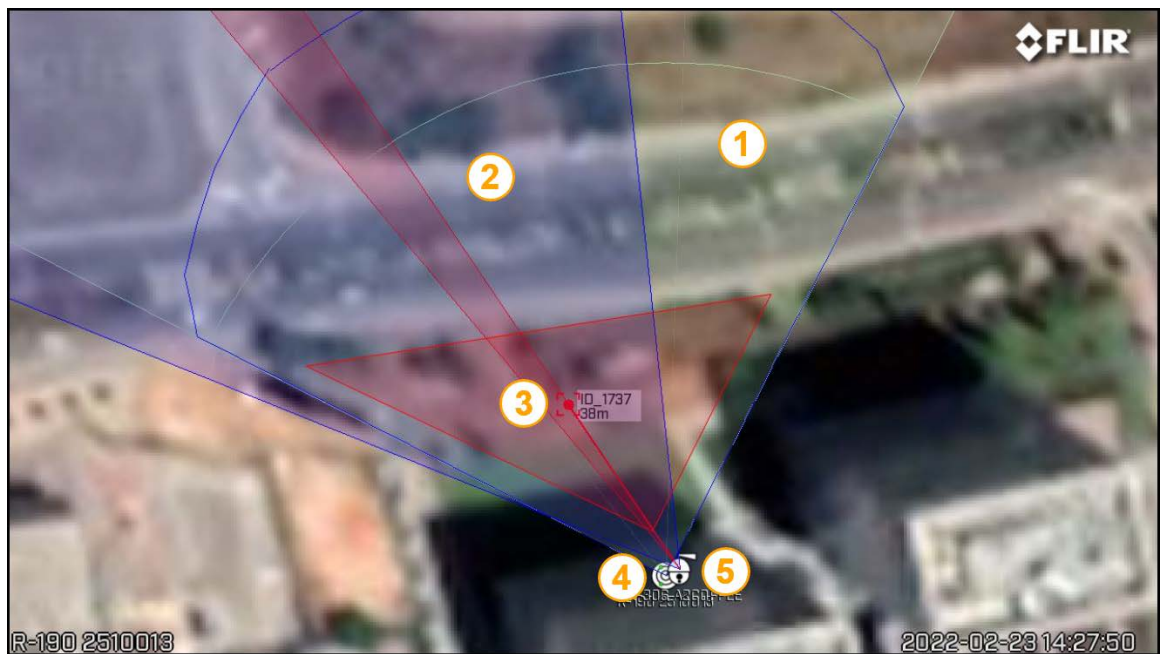


Installation

- **None**—PTZ camera stays at the current position.
- **Home Position**—PTZ camera moves to its home position.
- **Preset**—PTZ camera moves to the specified preset.
- Specify the behavior of the PTZ camera when it is in an automatic mode and a user performs a manual action such as moving, zooming, or focusing the camera:
 - **None**—PTZ camera does not allow manual commands and ignores them.
 - **Exit**—PTZ camera exits the automatic mode and performs the manual action.
 - **Exit and Come Back**—PTZ camera exits the automatic mode, performs the manual action, and then returns to the automatic mode after the specified Timeout, between 1-100 seconds.

The camera immediately applies and saves these settings. You do not have to click **Save**.

The following image from the radar's video stream shows a DX-Series camera tracking an object detected by the radar inside an alarm region, overlaid onto a map that has been uploaded and calibrated.



1. R-Series radar detection field
2. DX-Series camera horizontal field of view
3. Detected object inside alarm region
4. Radar location
5. DX-Series camera location

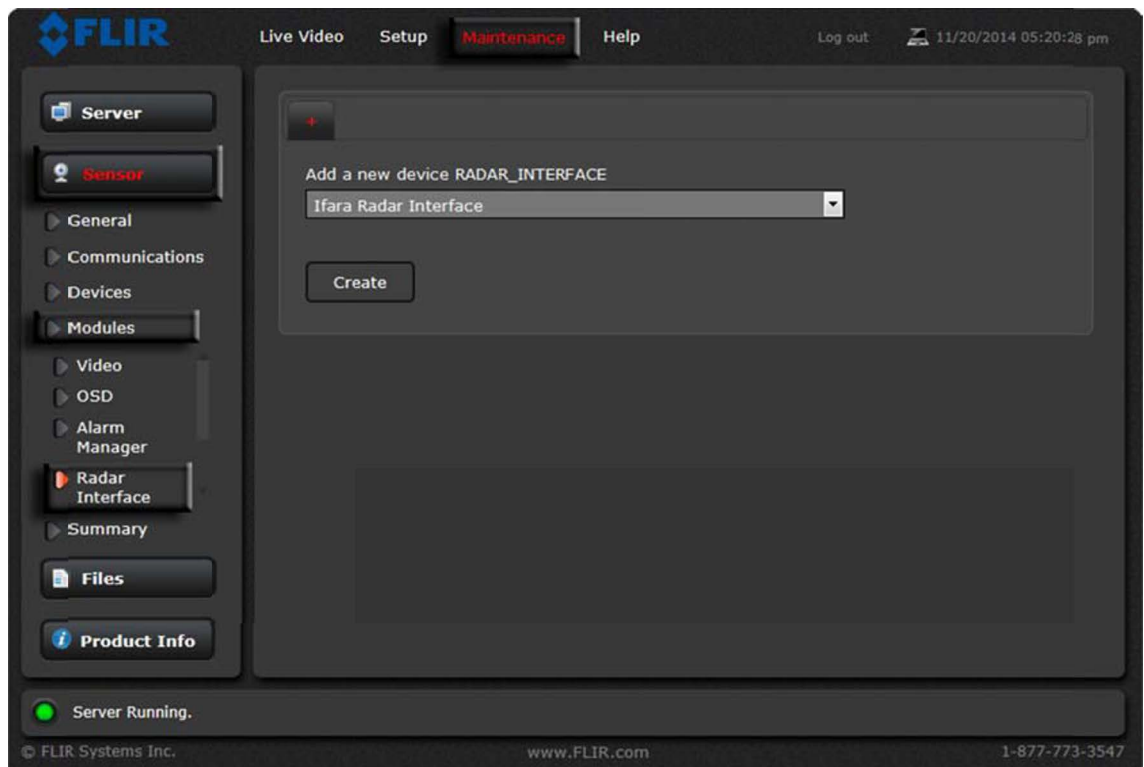
Installation

2.10.2 Pairing with a PT-Series HD Camera

To pair a PT-Series HD camera with an Elara R-Series Radar, a PT-Series HD camera user assigned the expert or admin role can enable and configure a geotracking radar interface using *the PT-Series HD camera's web page*. The PT-Series HD camera requires firmware v1.3.0.29 or later. For information about how to update the camera's firmware, see the *PT-Series HD Installation and User Guide*.

To enable a geotracking radar interface on a PT-Series HD camera:

- Step 1 Access the camera and log in to the camera's web page. For information about accessing the camera, see the *PT-Series HD Installation and User Guide*.
- Step 2 Open the Maintenance menu and then open **Sensor > Modules > Radar Interface**.



- Step 3 Stop the camera's server.



- Step 4 Under Add a new device RADAR_INTERFACE, select Ifara Radar Interface. Then, click **Create**.

The camera creates the radar interface and the settings appear.

RADAR_INTERFACE 0

Device ID 0 • Driver: Ifara Radar Interface

Enabled
Yes

IP Address
10.82.100.190

TCP Port
1001

Associated PLAT Id
0

Dwelling Time
20

IR Focus To Infinity When Tracking
No

Save Read

Step 5 Enable the interface.

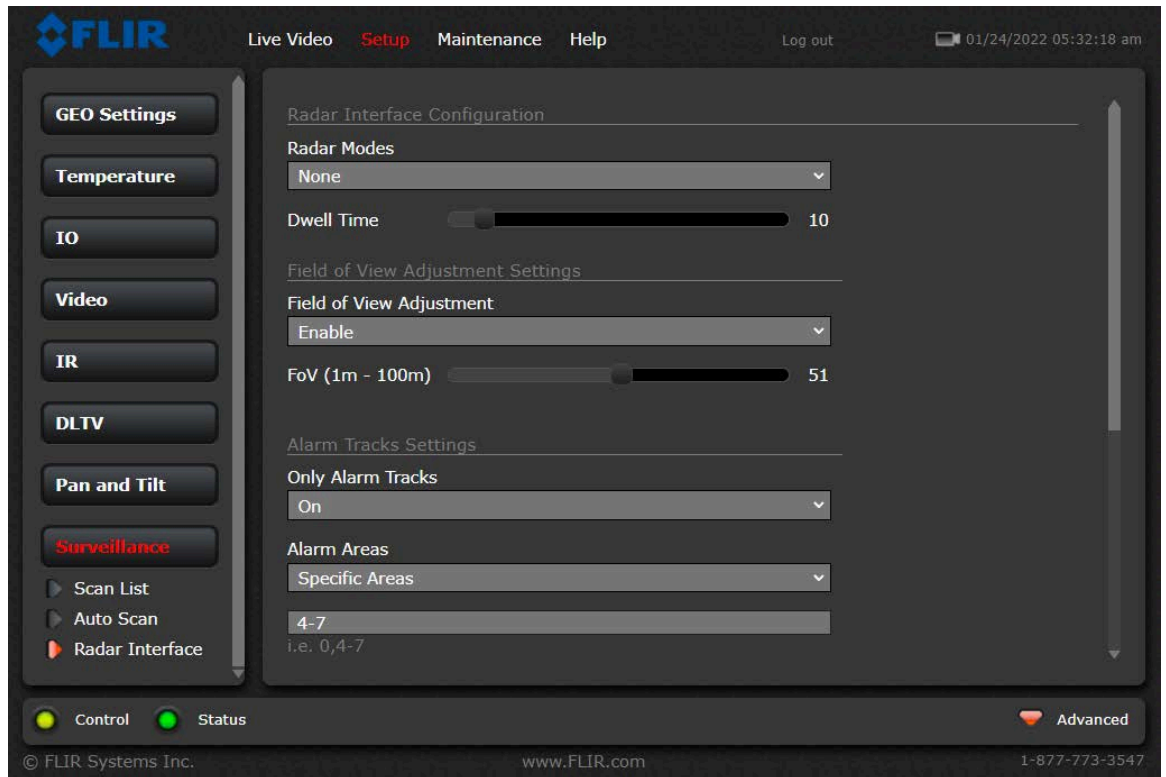
Step 6 Specify:

- **IP Address**—The radar’s IP address.
- **TCP Port**—The TCP port number the radar’s Nexus server uses (1001). This is *not* the port for the radar nor for its web page.
- **Associated PLAT Id**—Make sure it is 0 (zero).
- **Dwelling Time**—The amount of time, in seconds, that elapses between the camera pointing at targets, when the camera is in Track Scan mode. It does not apply to any other camera modes.
- **IR Focus To Infinity When Tracking**—Enable to set the camera’s focus at infinity when it is engaged on a geotrack.

Step 7 Click **Save**.

To configure the geotracking radar interface:

In the Setup menu, open **Surveillance > Radar Interface**.



You can:

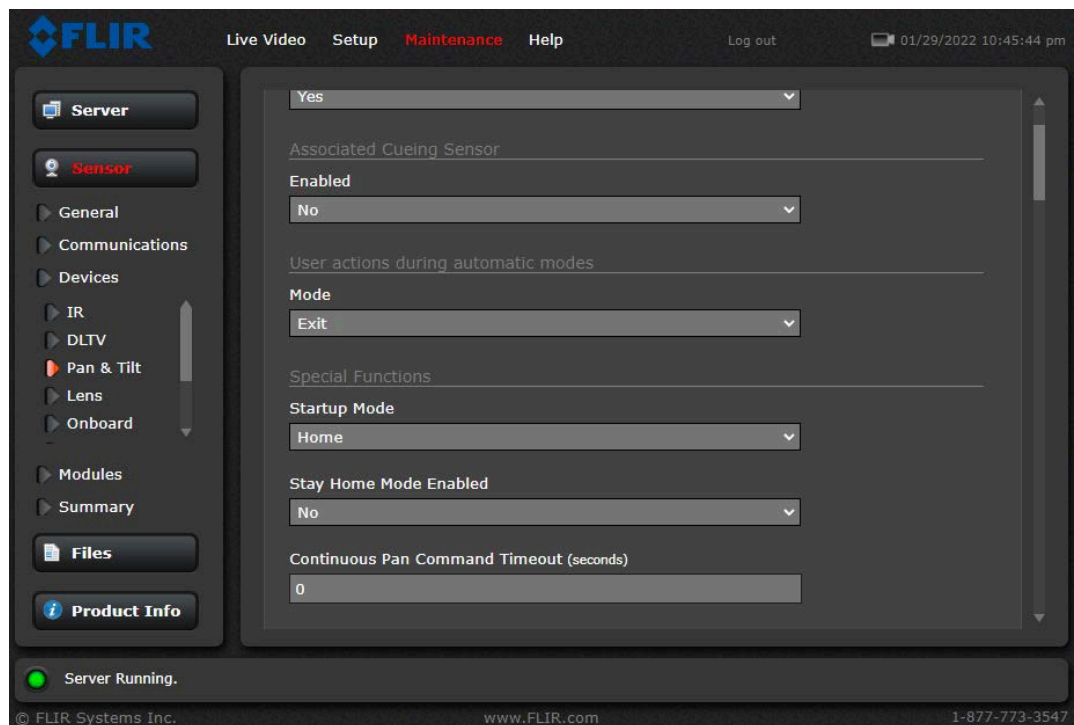
- Select a Radar Mode:
 - **Track Scan**—The camera performs a tour scanning all active geotracks. It follows each geotrack for a specified dwell time.
 - **Engage Last**—The camera follows the most recently detected geotrack.
 - **Engage Closest**—The camera follows the geotrack closest to the camera.
- Specify a Dwell Time between 0-100 seconds. In Track Scan mode, the camera stays on each geotrack for the specified dwell time.
- Enable Field of View Adjustment. The distance from the radar to a tracked object determines the PT-Series HD camera's zoom. Specify the PT-Series HD camera's field of view (FoV), between 1-100 meters.
- Enable Only Alarm Tracks. The PT-Series HD camera only tracks objects detected by the radar in an alarm region. Select:
 - **All Areas**—The camera tracks objects detected in all alarm regions.
 - **Areas**—The camera tracks objects detected in specified alarm regions. To specify specific regions and ranges of regions, you can use a comma. For example, you can specify 0, 4-7.

Installation

- Specify the Idle State Mode, the behavior of the camera when it is in a radar mode and there is no geotrack to engage:
 - **None**—Camera stays at the current position.
 - **P&T Home**—Camera moves to its home position.
 - **Go to Preset**—Camera moves to the specified preset.

To configure the camera to start up in a geotracking radar mode:

Step 1 In the Maintenance menu, open **Sensor > Devices > Pan & Tilt**.



Step 2 Under Special Functions, for Startup Mode, select one of the geotracking radar modes: Track Scan, Engage Last, or Engage Closest.

Step 3 Scroll to the bottom of the page and click **Save**.

Step 4 Restart the camera's server.



2.10.3 Confirming R-Series Radar and PTZ Camera Pairing Configuration

Step 1 If you are not logged in to *the radar's web page*, log in to it.

Installation

Step 2 In View Settings, right-click on the live radar display, within the radar's detection range, and select **Add Virtual Track**.



A virtual track appears at the right-click point, on the live radar display and in the video stream. The radar communicates the virtual track to the PTZ camera, which points to the virtual track when pairing is properly configured. While the virtual track is enabled, the radar ignores actual tracks.

Step 3 Make sure the PTZ camera is pointing at the virtual detected object.

If it is not, right-click on the live radar display and select **Remove Virtual Track**. Then, check and adjust the camera's and the radar's georeference settings.

Select **Add Virtual Track** and check again whether the PTZ camera is pointing at the virtual detected object.

3 Operation

This chapter includes information about [Accessing the Radar](#) and how to operate it using the [View Settings Home Page](#).

3.1 Accessing the Radar

To operate and configure the radar, you first need to access it. You can access the radar by logging in to its web page. The web page supports Google Chrome® and other popular web browsers.

To log in to the radar's web page:

Step 1 Do one of the following:

- In the DNA tool, double-click the radar in the Discover List. Identify the radar by model name, R-x90; and name. The default name is R-x90 followed by the radar's serial number.
- Type the radar's IP address in a browser's address bar (when the PC and the radar are on the same network). If you do not know the radar's IP address, you can use the DNA tool to discover it.

The radar's web page login screen appears.

Step 2 Type a user name and the password, and then click **Log In**.

When logging in to the radar's web page for the first time or for the first time after resetting the radar to its factory defaults, type *admin* for the user name and for the password.

If you do not know the user name or password, contact the person who configured the radar's users and passwords.

Step 3 When logging in to the radar's web page for the first time or for the first time after resetting the radar to its factory defaults, specify a new password for the admin user and then log back in using the new password.

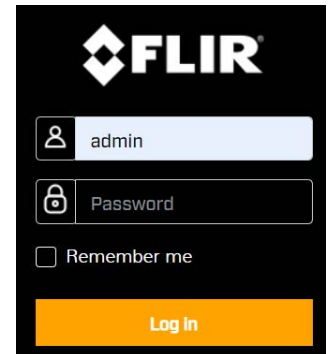
Use a strong password consisting of at least 12 characters and at least one uppercase letter, one lowercase letter, and one number. Passwords can include the following special characters: |@#~!\$&<>+_-.,*?=. .

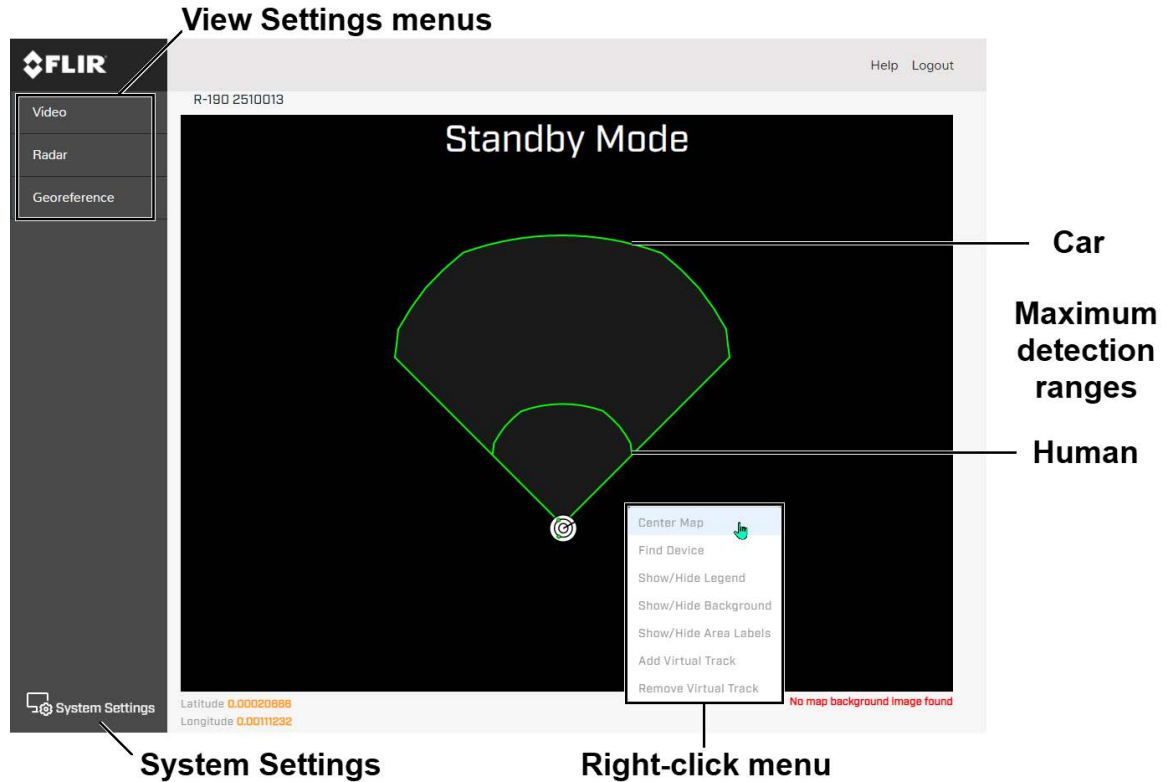
The [View Settings Home Page](#) appears.

3.2 View Settings Home Page

The live radar appears on the View Settings page. When logging in to the radar's web page for the first time or for the first time after resetting the radar to its factory defaults, the radar is in Standby Mode. To turn the radar on, go to the [Radar Page](#).

When a user assigned the expert or admin role logs in, View Settings menus and the System Settings link appears.





View Settings page for users assigned the admin or expert role - factory default

Live Radar Display

You can:

- Move the live radar display around by clicking on it, holding, and dragging.
- Zoom in and out using the mouse wheel, when the mouse pointer is over the radar display.
- Right-click on the radar display and:
 - **Center Map**—Centers the map in the display, if one has been uploaded and calibrated on the [Map Page](#).
 - **Find Device**—Centers the radar in the display. When the radar does not appear in the display window, select Find Device. For example, after you save the radar's coordinates or calibrate a map, the radar's position can be outside the display window.
 - **Show/Hide Legend**—Toggles the display legend.
 - **Show/Hide Background**—Toggles the map or other background image.
 - **Show/Hide Area Labels**—Toggles alarm and exclusion region labels.
 - **Add/Remove Virtual Track**—Toggles a virtual geotrack that you can use to test features such as PTZ pairing and geotracking.

Operation

After defining the radar's orientation on the [Georeference Page](#), the radar's maximum human and car detection ranges appear in green (R-190: 125 / 300 meters; R-290: 200 / 400 meters). Also, after specifying the radar's geographical coordinates and when the mouse pointer is hovering over the radar display, the pointer location's accurate latitude and longitude appear below the radar display.

System Settings and Other Options

Users assigned the admin or expert role can click **System Settings** to configure the radar. For more information, see the [Configuration](#) chapter.

Additional choices are for Help and Logout.

3.3 Making Changes to Settings

The radar's configuration files store the following sets of settings:

- **Factory default settings**—The settings when you first connect the radar to power, and when resetting the radar to its factory default settings (see [Firmware & Info Page](#)). A partial factory reset restores all factory default settings except the settings on the [Network Page](#).
- **Saved settings**—The settings you save as you operate and configure the radar. When the radar reboots, it restores these settings. Changes made to any page since saving changes are lost.

Tip


Whenever possible, Teledyne FLIR recommends testing new settings before saving them because saving changes overwrites the previously saved settings.

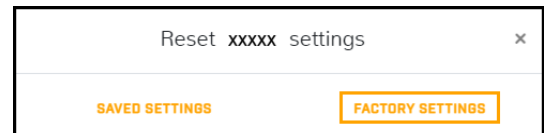
View Settings

When you change most View Settings, the **Reset** and **Save** buttons become enabled. For some View Settings, the radar immediately applies the changes, but does not save them; for example, on the [Video Page](#) and [Radar Page](#). For others, the radar does not apply changes until you save them.




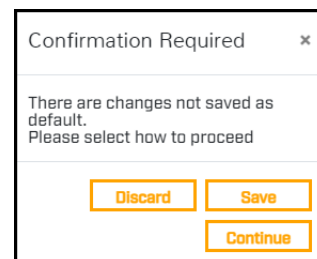
Regardless of whether the radar has already applied changes, to save all changes since the last time these settings were saved, click **Save**. This can include earlier changes that were not saved.

To restore previously saved settings or the factory default settings, click **Reset**. To close the message and return to the page without restoring settings, click the close icon .



Tip

If you try to navigate to a different page before saving changes, a confirmation message appears. In most cases, you can click **Continue**, which allows you to navigate to other pages and test the setting changes. Then, you can return to the page and save the new settings. Or, you can discard the changes; save them; or close the confirmation message without discarding the changes or saving them by clicking the close icon .

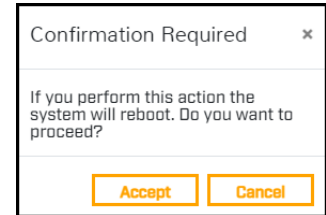


System Settings

When you change most System Settings, the **Discard Changes** link and the **Save** button become enabled. For many System Settings, the radar does immediately apply the changes.



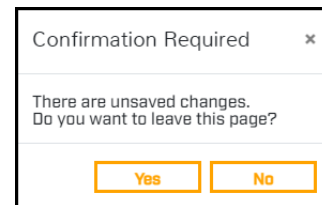
Regardless of whether the radar has already applied changes, to save changes, click **Save**. To discard changes and restore previously saved settings or the factory default settings, click **Discard Changes**.



Changes to many System Settings require the radar to reboot. After clicking **Save**, a confirmation message appears. To save the changes, and reboot the radar with the changes applied, click **Accept**. To close the confirmation message and remain on the page — without discarding the changes or saving them — click **Cancel** or click the close icon **X**.

Tip

If you try to navigate away from the page before saving changes, a confirmation message appears. To leave the page, discard changes, and restore previously saved settings, click **Yes**. To close the confirmation message and remain on the page — without discarding the changes or saving them — click **No** or click the close icon **X**.



3.4 Video Page

On the Video page, you can:

- Modify the parameters of the radar's video stream.
- Edit the video stream frame.

The radar produces a video stream that can be viewed on supported VMSs such as FLIR UVMS; third-party, ONVIF-compliant systems; and on client programs such as the VLC media player.

The video stream uses a protocol generally referred to as Real-time Transport Protocol (RTP), but there are actually many protocols involved, including Real-Time Transport Control Protocol (RTCP) and Real Time Streaming Protocol (RTSP). The video stream URL incorporates the IP address of the radar and the RTSP port (554): **rtsp://<radar IP address>:554/map**. For example, using the radar's default IP address, **rtsp://192.168.0.250:554/map**. RTSP authentication is enabled. To access any of the radar's video streams, use the name and password for any of the radar's users.

By default, the radar provides a 1280x720 MJPEG video stream at two frames per second (FPS) and at 70% quality. In general, modifying the Resolution, Frame Rate, and Quality settings is not necessary. In some installations, such as when the video stream is sent over a wireless network, it might be useful to adjust the video stream to reduce the bandwidth requirements. Higher resolution, faster frame rate, and higher quality requires more bandwidth.

Use the default values initially, and then modify and test them incrementally to determine when bandwidth and quality requirements are met.

Operation



Video page - Video Stream (default) selected with map uploaded

To edit the video stream frame:

- Step 1 For Map Display, select Web.
- Step 2 Select Edit Video Stream Region. The video stream frame appears as an overlay in the live radar display.



Video page - Web selected

Tips

- When Edit Video Stream Region is selected, the mouse pointer defines the video frame; it is not possible to zoom or move the Web Map Display. Therefore, before selecting Edit Video Stream Region, Teledyne FLIR recommends moving the live radar display into position and adjusting the zoom if necessary.
- The video stream region borders should appear in red. If they appear in black, the region is larger than the uploaded map. Teledyne FLIR recommends reducing the size of the video stream region or uploading a map covering more area.

Step 3 To change the size of the video frame: Hover over the handle in the bottom-right corner of the frame, and then click and drag it.

Step 4 To move the entire video frame: Hover over the video frame, and then click and drag it.



3.5 Radar Page

On the Radar page, you can specify:

- **Radar Mode**—Whether the radar is On or in Standby mode.
- **Sensitivity**—Low, Mid (default), or High. Decreasing sensitivity can reduce false alarms and small-object detection, but could miss some objects. When the detection zone is more cluttered, increasing the sensitivity detects more targets, at the risk of increasing the false alarm rate. The false alarm rate depends on the environment: the existence of static clutter; solid surfaces that reflect the radar signal; moving objects; strong winds blowing leaves, trees, and bushes; and so on.

You can also eliminate alarms from specific areas by defining exclusion regions; for example, areas with leaves, trees, or bushes that can blow in the wind.

- **Standalone**—Nearby radars can cause interference. For example, if you are using this radar in conjunction with one or more other R-Series radars. To eliminate interference, you can assign a unique chirp slot, or frequency channel, to each radar.

If there are no other radars within one kilometer (R-190) or within two kilometers (R-290), select Yes. Otherwise, select No, and then specify a unique chirp slot for this radar. R-190 valid values are 0-25 (26 slots); R-290 valid values are 0-10 (11 slots).

Operation

Teledyne FLIR recommends spreading chirp slots over the valid value range. For example, assign three R-190 radars slots 0, 9, and 17; assign three R-290 radars slots 0, 4, and 8; and assign two R-290 radars slots 0 and 5.

- **Track Alarms**—Whether radar alarms are tracked (Arm) in the live radar display or not (Disarm).

To add an alarm or an exclusion region:

Step 1 Click one of the **Add Region** options.

- **Alarm Regions (Areas or Tripwires)**—Detection is enabled and alarms are triggered; appear in red.
- **Exclusion Regions**—Detection is disabled and alarms are not triggered; appear in yellow.

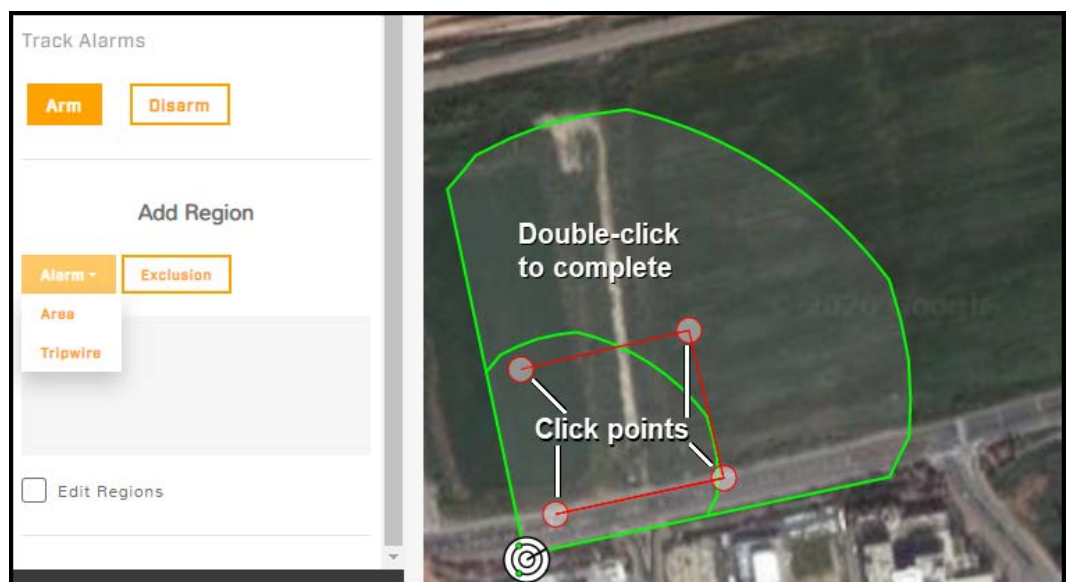
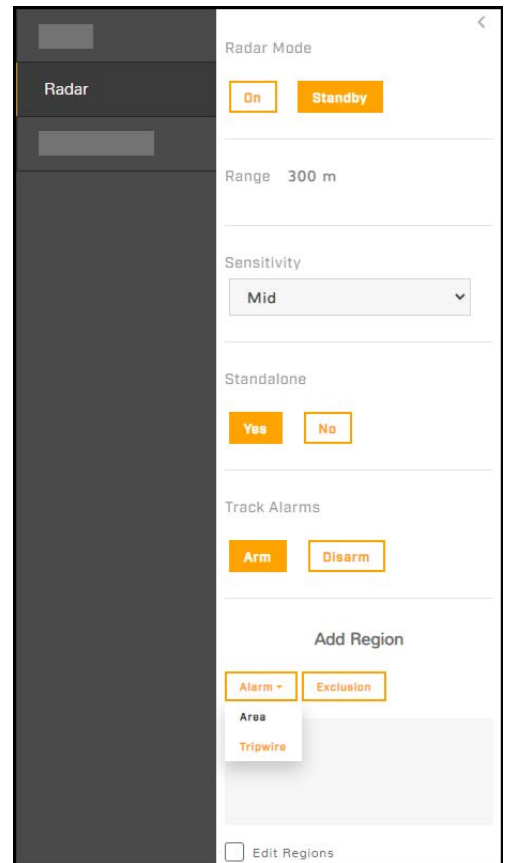
Step 2 Click and release on the radar display to create the first point of the region.

Step 3 Continue adding points (up to 25).

Step 4 To complete the region, double-click on the radar display.

To cancel creating a region, press **Esc**.

Step 5 To define another region, repeat steps 1-4.



Managing Regions

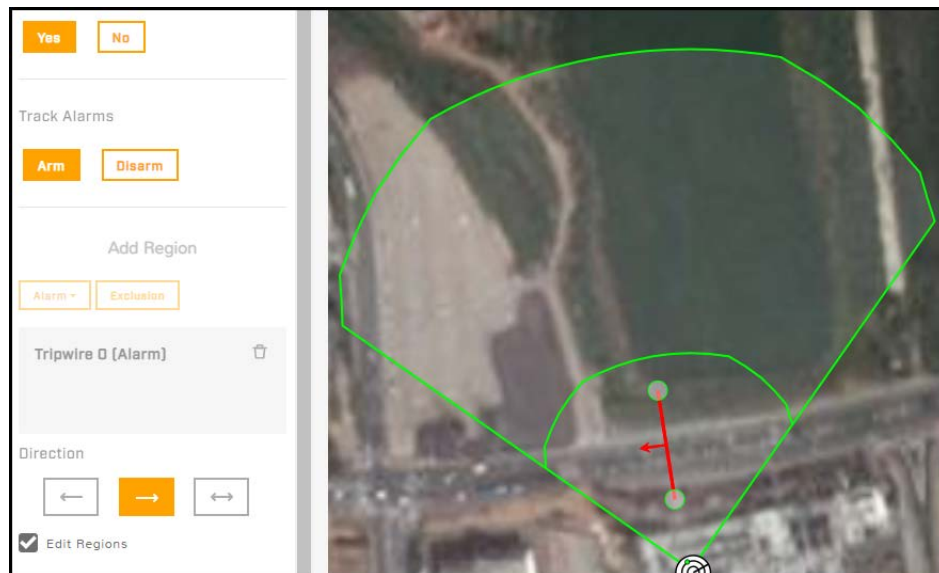
To edit an existing region, select **Edit Regions**, and click the region. You can:

- Move region points. Click on the point, hold, and drag.
- Define a tripwire's detection direction.

By default, tripwires are bidirectional. However, you can configure them to be unidirectional. When configured as unidirectional, the direction selection arrows refer to the direction of movement over the tripwire *as seen from the first tripwire point created*.



At left, the first point of a tripwire has been defined and the tripwire is being drawn from top to bottom. Below, the tripwire has been completed and the *left-to-right* direction button has been selected. Because detection direction relates to the first tripwire point created, the direction arrow on the radar display is *right to left* and the radar triggers alarms when it detects movement over the tripwire in that direction.



Operation

When Edit Regions is selected, it is not possible to add regions.

To delete a region, select the region and click the trash can icon next to it.

Tips












- To move the radar display, and to zoom in and out, you can use the mouse. To move the radar display, click on the radar display, hold, and drag. To zoom in or out, use the mouse scroll wheel.
- Exclusion regions can help eliminate alarms from a tree or bush moving in the wind, for example.

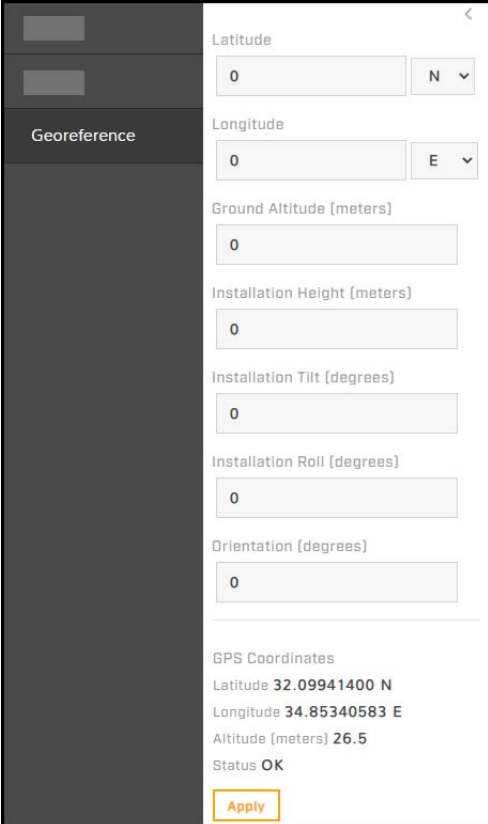
3.6 Georeference Page

On the Georeference page, you can:

- See the radar, its detection range, detected objects, and other information on a reference map that has been uploaded and properly calibrated on the [Map Page](#) in System Settings.
- Specify the radar's geographical location and mounting position.

The following appear in the display, when present:

Icon	Description
	Radar—a circle around this icon indicates the radar you are currently configuring
	PTZ camera
	Fixed camera
	Radar detection range
	Visible camera detection range
	Thermal camera detection range
	Radar alarm region
	Radar exclusion region
	Detected object
	Detected object in alarm region
	Object engaged by PTZ camera



Latitude
0 N

Longitude
0 E

Ground Altitude (meters)
0

Installation Height (meters)
0

Installation Tilt (degrees)
0

Installation Roll (degrees)
0

Orientation (degrees)
0

GPS Coordinates
Latitude 32.09941400 N
Longitude 34.85340583 E
Altitude (meters) 26.5
Status OK

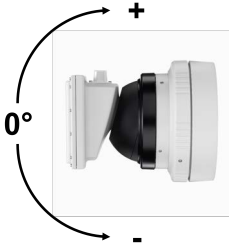

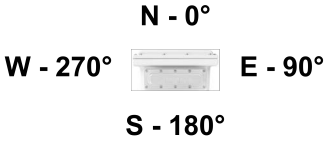
Apply

Operation

Specify the radar's **Latitude** and **Longitude**:

- Under GPS Coordinates, click **Apply**. The radar's onboard GPS provides latitude and longitude coordinates, along with the unit's overall altitude.
- If a reference map has been uploaded and properly calibrated, you can retrieve the radar's latitude and longitude coordinates by right-clicking on the map and clicking **Georeference Sensor**.
- Manually specify the coordinates, up to eight decimal places.

Specify the radar's **Ground Altitude** and **Installation Height**. If you applied the unit's overall altitude from the radar's onboard GPS, subtract the ground altitude from the overall altitude and adjust the installation height accordingly. Both settings are in meters above sea level. If you don't know the ground altitude or installation height, you can specify zero (0).

Installation Tilt	Installation Roll	Orientation
The vertical angle of the radar; when a radar is pointing down (below horizontal), the tilt angle is negative.	The horizontal rotation angle of the radar; facing a radar leaning to the right, the roll angle is negative.	The direction the radar is pointing, between 0-360 degrees from North, up to two decimal places. For geotracking, must be accurate and precise.
		

Tips

- Onboard GPS provides accurate coordinates to within a few meters. You can fine tune and precisely position the radar on the map by manually adjusting the last 2-3 decimal places of the latitude and longitude values. To save these changes, click **Save**. However, clicking **Apply** overwrites such manual adjustments, even if they were saved.
- To specify the radar's accurate, precise orientation, use the virtual track feature:
 1. Right-click on a detected object and select **Add Virtual Track**. A virtual track appears at the right-click point, on the live radar display and in the video stream.
 2. Adjust the orientation setting until the virtual track location matches the actual location of the detected object.
- The radar's configuration files do not store factory default Georeference settings. To restore Georeference settings to the radar's factory condition, manually change them to zero (0).

Operation

The radar can report georeference information via FLIR CGI or ONVIF, which:

- Allows the user or an application to show the radar on a map and the direction the radar is facing, along with the radar's detection range.
- Supports cueing or showing radar tracks and I/O alarms.

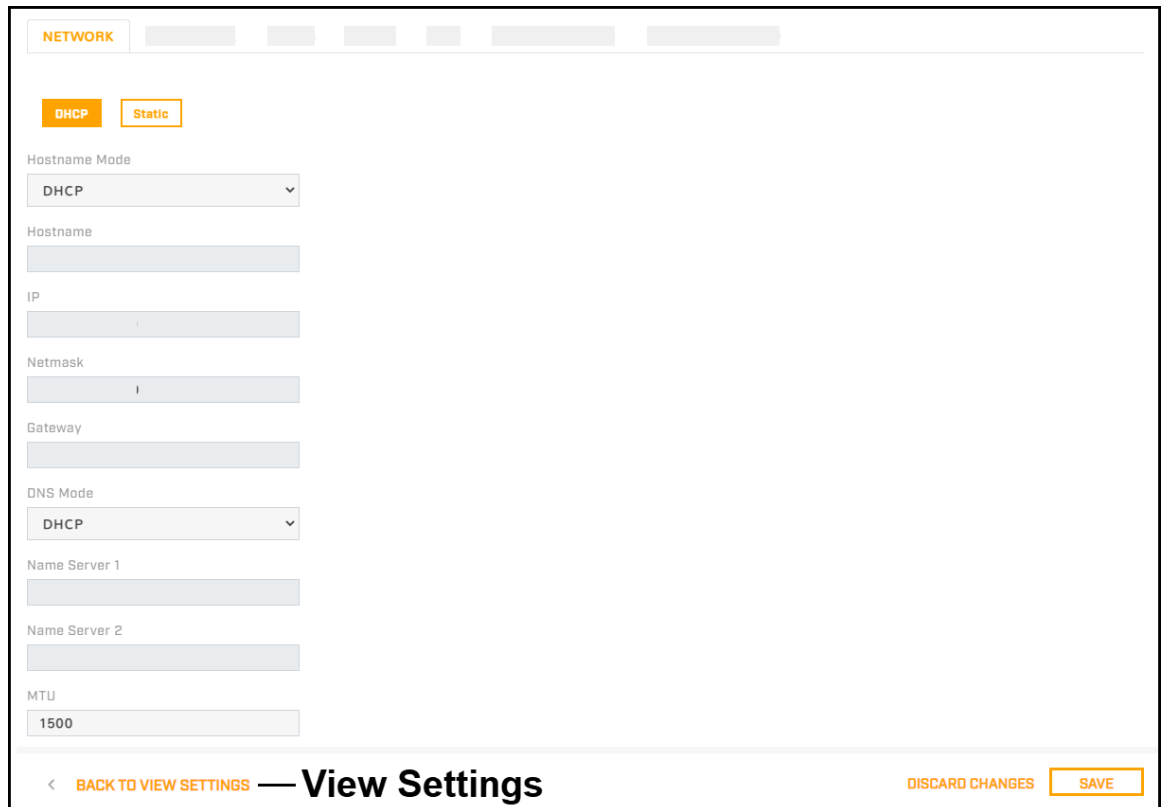
4 Configuration

Users assigned the admin or expert role can click **System Settings** on the [View Settings Home Page](#) to access:

- [Network Page](#)
- [Date & Time Page](#)
- [Users Page](#)
- [Cyber Page](#)
- [Map Page](#)
- [Radar Settings Page](#)
- [Firmware & Info Page](#)

4.1 Network Page

If you do not know how to configure these settings, contact your network administrator.



The screenshot shows the 'NETWORK' configuration page. At the top, there are two tabs: 'DHCP' (selected) and 'Static'. Below the tabs, the following settings are visible:

- Hostname Mode: DHCP (dropdown menu)
- Hostname: [text input field]
- IP: [text input field]
- Netmask: [text input field]
- Gateway: [text input field]
- DNS Mode: DHCP (dropdown menu)
- Name Server 1: [text input field]
- Name Server 2: [text input field]
- MTU: 1500 (text input field)

At the bottom of the page, there is a navigation bar with a back arrow, the text 'BACK TO VIEW SETTINGS', a separator line, the page title 'View Settings', and two buttons: 'DISCARD CHANGES' and 'SAVE'.

The DHCP (default) and Static buttons at the top of the Network page specify the IP addressing mode. If the radar is in DHCP IP addressing mode, but a DHCP server is not available on the network, the radar's IP address defaults to 192.168.0.250.

In Static IP addressing mode, specify:

- **IP**—The radar's IP address.

Configuration

- **Netmask**—The default value is 255.255.255.0.
- **Gateway**

Caution!

After changing the radar's IP address, the PC you are using to access its web page might no longer be on the same network and can no longer access the radar's web page. To access its web page again, change the PC's IP address to be on the same network as the radar.

- **Hostname Mode**—DHCP or Static (default); when Static, specify the hostname for the radar's server.
- **DNS Mode**—In DHCP IP addressing mode, can be DHCP or Static. In Static IP addressing, the DNS Mode is also Static.

In Static DNS Mode, specify:

- **Name Server 1**—The primary domain name server that translates host names into IP addresses
- **Name Server 2**—A secondary domain name server that backs up the primary DNS
- **MTU**—Maximum transmission unit, the largest amount of data that can be transferred in one physical frame on the network. For Ethernet, the MTU is 1500 bytes (the default setting). For PPPoE, the MTU is 1492. Valid values are 1000-1500.

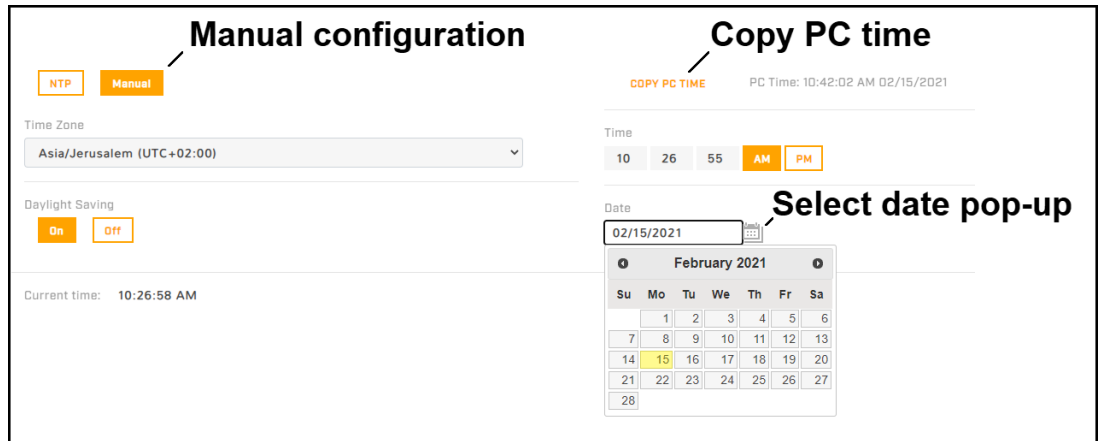
4.2 Date & Time Page

Use the Date & Time page to configure the date and time settings.

The screenshot shows the 'DATE & TIME' configuration page. At the top, there are three tabs: 'DATE & TIME' (selected), 'NTP', and 'Manual'. Below the tabs, there are three sections: 'NTP', 'Daylight Saving', and 'NTP Server'. The 'NTP' section has two buttons: 'NTP' and 'Manual', with 'Manual' selected. The 'Daylight Saving' section has two buttons: 'On' and 'Off', with 'On' selected. The 'NTP Server' section has two buttons: 'DHCP' and 'Manual', with 'DHCP' selected. At the bottom of the page, it displays 'Current time: 10:07:26 AM' and 'Current date: 02/15/2021'.

The radar can obtain the date, time, and time zone from an NTP server, or you can manually specify that information.

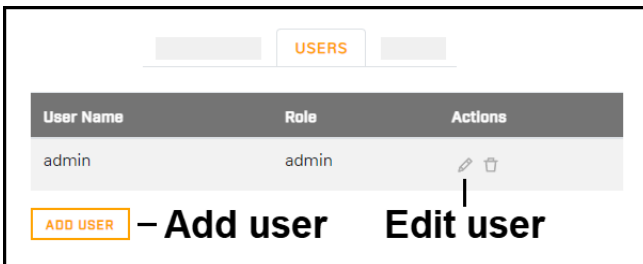
In Manual mode, you can copy the local PC's time or specify the hour, minute, second, or date.



When set to NTP, you can specify whether the radar obtains the NTP server information from the DHCP server on the network, or manually enter the NTP server information.

4.3 Users Page

Users assigned the admin role can add and delete users (except the default admin user), and can set or change all passwords.



Users assigned the expert role see the user currently logged in; they cannot add, edit, or delete users.

To maintain security of the system, set up user names and passwords for each required login account.

Passwords must consist of at least 12 characters and include at least one uppercase letter, one lowercase letter, and one number. Passwords can include the following special characters: |@#~!\$%<>+_-.,*?= .

Assign one of the following roles, according to the level of access the user requires:

Role	user	expert	admin
Access	Can: <ul style="list-style-type: none"> View the live radar display Zoom the live radar display View the Help page Log out 	Can access and use all View Settings and System Settings pages, menus, controls, and settings, except the Users page.	Can access and use all of the radar's web pages, including the Users page (but cannot delete the default admin user).
All roles can access the radar's video stream, which requires authentication. You can use the name and password for any of the radar's users.			

Configuration

Add User

Enter user

Enter password

Confirm password

Set role

Click Save

Edit User

Enter password

Confirm password

Set role

Click Save

Delete User

User Name	Role	Actions
admin	admin	
expert	expert	
user	user	
darose	user	

[ADD USER](#)

Click trash can icon

Click to confirm

4.4 Cyber Page

The Cyber page provides security configuration settings for:

- [Certificates](#)
- [IEEE 802.1X-Compliant Communication](#)
- [Transport Layer Security \(TLS\) and Secure HTTP \(HTTPS\) Communication](#)
- [Other Cybersecurity Services](#)
- [IP Filtering](#)

4.4.1 Certificates

Before you can enable TLS/HTTPS, you need to generate or upload a valid certificate. On the Certificates section of the Cyber page, you can:

- Use the radar's web page to generate a self-signed certificate.
- Download or upload a self-signed certificate.
- Upload a certificate signed by a third-party.

The screenshot shows a web interface for configuring certificates. At the top, there are three tabs: a grey one, 'CYBER' (highlighted in orange), and another grey one. On the left is a sidebar with a 'Certificates' section expanded, showing sub-items: '802.1X', 'TLS/HTTPS', 'Services', and 'IP Filter'. The main content area is titled 'Certification area' and has 'TLS/HTTPS' and '802.1X' selected. Below this, there are two radio buttons: 'Self-Signed' (selected with an orange dot) and 'Upload Certificate'. The form contains several input fields with placeholder text '---': 'Country Code', 'Province Name', 'City Name', 'Common Name', 'Organization Name', 'Organization Unit Name', 'Email Address', and 'Expiration Time (months)'. At the bottom of the form is an orange-outlined button labeled 'CREATE CERTIFICATE'.

To generate and install a self-signed certificate:

- Step 1 In the Certificates section, under Certification area, select **Self-Signed**.
- Step 2 Enter certificate information such as country code, city name, and organization name. The Common Name can be a valid IP address or domain.
- Step 3 Click **Create Certificate**.

The radar generates the certificate and certificate information appears in the Download certificate section.
- Step 4 Verify that the radar certificate files are valid. Make sure *Certificates are OK* appears under the certificate information.
- Step 5 Reboot the system by clicking **Reboot**.

Configuration

Self-Signed Upload Certificate

Country Code	Province Name
US	Florida
City Name	Common Name
Miami	10.70.50.205
Organization Name	Organization Unit Name
Factory	Perimeter Security
Email Address	Expiration Time [months]
perimetersecurity@factory.com	12

CREATE CERTIFICATE

System must be rebooted for the changes to be effective **REBOOT**

Download certificate

Common Name	Organization Name
10.70.50.205	Factory
Issuer	
Factory	
Country	Locality
US	Miami
Validity Period [From-To]	
Jan 17 08:53:35 2022 GMT	Jan 12 08:53:35 2023 GMT

Certificates are OK

[PUBLIC KEY](#) | [PRIVATE KEY](#) | [CA CERT](#)

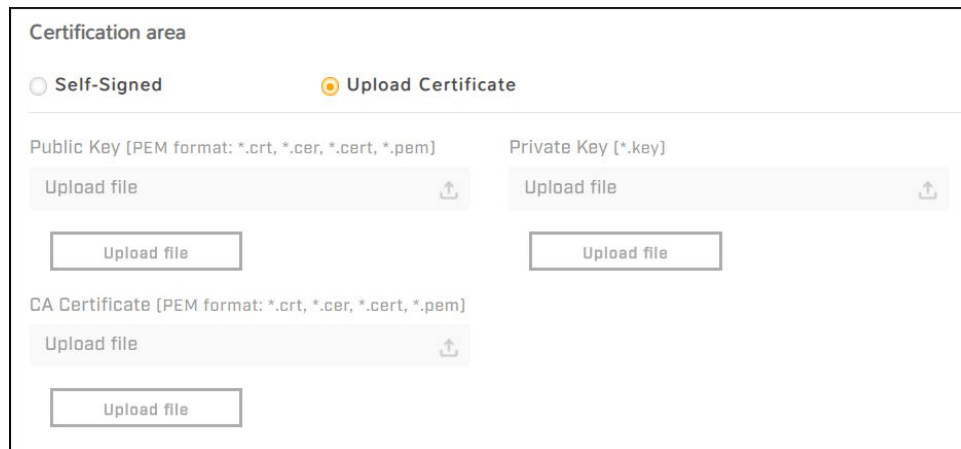
Configuration

To upload a self-signed or third-party CA signed certificate:

Certificates and keys must be in PEM format. Common file extensions for TLS files in PEM format are:

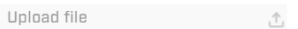

- **For certificate and public key files:** *.crt, *.cer, *.cert, *.pem
- **For private key files:** *.key

Step 1 Under Certification area, select **Upload Certificate**.



The screenshot shows a web interface titled "Certification area". At the top, there are two radio buttons: "Self-Signed" (unselected) and "Upload Certificate" (selected). Below this, there are three sections for file uploads. The first section is "Public Key (PEM format: *.crt, *.cer, *.cert, *.pem)" with an "Upload file" button and a file selection icon. The second section is "Private Key (*.key)" with an "Upload file" button and a file selection icon. The third section is "CA Certificate (PEM format: *.crt, *.cer, *.cert, *.pem)" with an "Upload file" button and a file selection icon. Each "Upload file" button has a corresponding "Upload file" button below it.

Step 2 If you are uploading a self-signed certificate, under **Public Key** and then under **Private Key**:

- a Click  .
- b Select the appropriate key file.
- c Click  .

If you are uploading a third-party CA signed certificate, select and upload the **Public Key**, **Private Key**, and **CA Certificate**.

The certificate information appears in the Download certificate section.

Step 3 Verify that the radar certificate files are valid. Make sure *Certificates are OK* appears under the certificate information.

Step 4 Reboot the system by clicking **Reboot**.

Download Certificate

You can download a certificate and keys previously uploaded to or generated by the radar. If the certificate saved on the radar is self-signed, you can download the private and public key files. If the certificate was signed by a third-party CA, you can download the CA Certificate and the private and public key files.

Configuration

4.4.2 IEEE 802.1X-Compliant Communication

Enable or disable IEEE 802.1X-compliant TLS communication.

Specify the Extensible Authentication Protocol (EAP) method:

- TLS: Provide an Identity and Private Key Password.
- Protected Extensible Authentication Protocol (PEAP): Provide an Identity or an Anonymous Identity and a Password.

The screenshot shows a configuration page for IEEE 802.1X. On the left, there are several greyed-out input fields. The main content area has a section titled "802.1X" in orange. Below this title, there are two toggle buttons: "Enable" (highlighted in orange) and "Disable". Underneath, the "EAP method" is set to "TLS" (highlighted in orange), with "PEAP" also visible. Below the EAP method, there are two input fields: "Identity" and "Private Key Password", both of which are currently greyed out.

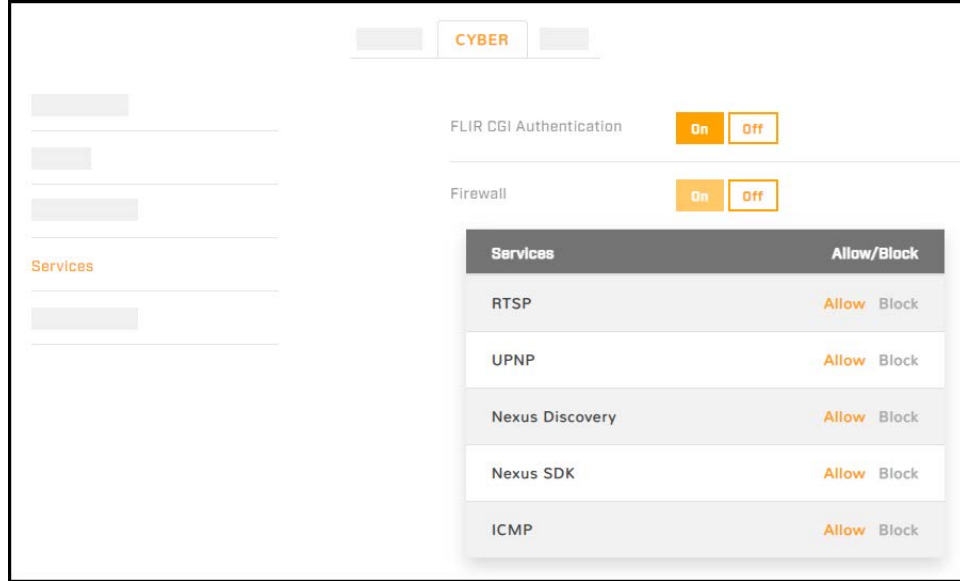
4.4.3 Transport Layer Security (TLS) and Secure HTTP (HTTPS) Communication

Enable or disable radar control using Transport Layer Security (TLS) / secure HTTP (HTTPS).

Enable or disable HTTPS redirect.

The screenshot shows a configuration page for TLS/HTTPS. On the left, there are several greyed-out input fields. The main content area has a section titled "TLS/HTTPS" in orange. Below this title, there are two toggle controls. The first is labeled "Control" and has "On" (highlighted in orange) and "Off" buttons. The second is labeled "HTTPS Redirect" and also has "On" (highlighted in orange) and "Off" buttons.

4.4.4 Other Cybersecurity Services



Enable or disable digest authentication for the FLIR CGI control interface. The default setting is **On** (enabled).

Firewall Settings

For enhanced security, the radar has a firewall that you can enable by clicking **On**. By default, when you enable the firewall, the following services are set to **Allow**, which means they remain enabled and their default ports remain open:

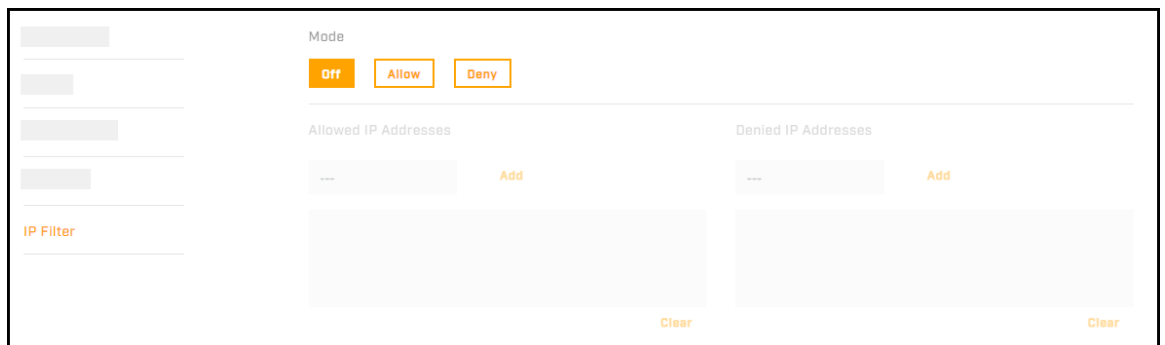
- RTSP
- UPNP
- Nexus Discovery
- Nexus SDK
- ICMP

To disable a service and its default port, click **Block**.

Caution!

Disabling services and ports can affect product functionality.

4.4.5 IP Filtering



Configuration


The radar's IP filter denies or allows access according to specific IPv4 addresses that you can define.

By default, the IP filter Mode setting is **Off**.

To define specific IP addresses that can access the radar, click **Allow**. The radar will deny access to all other IP addresses.

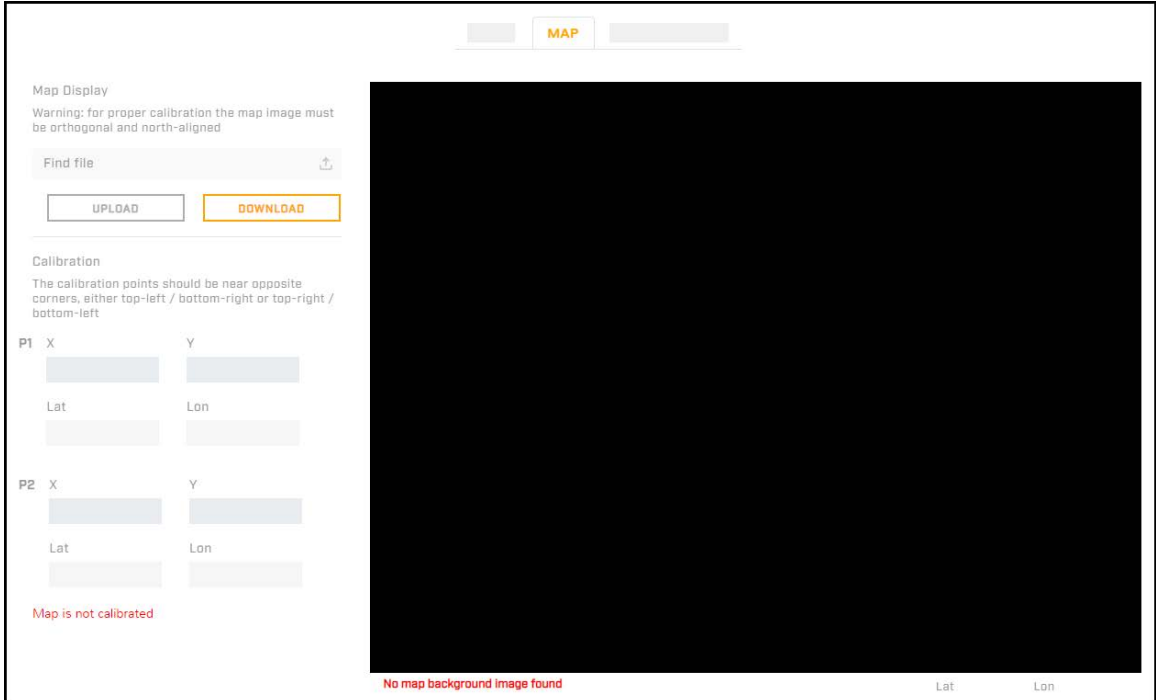
To define specific IP addresses that cannot access the radar, click **Deny**. The radar will allow access to all other IP addresses.

To add an IP address to a list, either under Allowed IP Addresses or under Denied IP Addresses, specify an IPv4 address and then click **Add**. You can specify up to 256 IP addresses.

To remove an IP address from a list, click the corresponding trash icon  .


4.5 Map Page

On the Map page, you can upload a reference map image upon which the radar overlays its display and you can calibrate the map. Onscreen messages appear when a map has not been uploaded or is not calibrated.



To create, upload, and calibrate a reference map image:

Step 1 Using an online map or GPS service such as Google Maps, download a North-facing reference map image of an area slightly larger than the radar's maximum detection range.

For example, open Google Maps or another online map and take a screenshot. In Windows 10, use the default screenshot keyboard shortcut (Windows logo key  + Shift

Configuration

+ S). Paste the screenshot into an image editor (for example, Paint). Then, save the image in JPG or PNG format.

Important

In the reference map image, North must be straight up, 0° from vertical. Also, the map image should be flat (2D).

Tips

- Keep in mind where the radar is or will be mounted and oriented.
- Use a large, high-resolution screen or display in its native resolution with no zoom. The quality and resolution of the map image should be high enough so that the reference map is useful when zooming in on the radar display or configuring the video stream region.
- Taking the screenshot with the map source in full screen (in Google Chrome, press F11) and turning off labels can produce better results.
- To move the radar display, and to zoom in and out, you can use the mouse. To move the radar display, click on the radar display, hold, and drag. To zoom in or out, use the mouse scroll wheel.
- It might take a few attempts at different settings to achieve the best result.

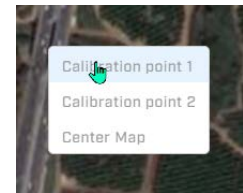
Step 2 Identify two calibration points for which you can obtain accurate and exact latitude and longitude coordinates. For example, intersections of two roads or highways.

For optimal calibration, the two calibration points should be as far apart as possible and on opposite sides of the map image. For example, at top-right and at lower-left.

Step 3 Under Map Display, click **Find file**, and then click **Upload**.

If the map successfully uploads, a confirmation message appears. Click **Accept**.

If a map does not successfully upload, try again. Try changing the quality or compression of the map image. Higher quality or lower compression increases the map file size.



Right-click on map on Map page

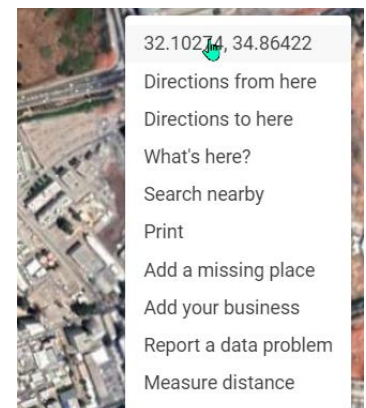
Step 4 Right-click on the first calibration point, and then select **Calibration point 1**.

The calibration point appears on the map.



Step 5 Enter the latitude (**Lat**) and longitude (**Lon**) coordinates for the first calibration point (**P1**). You can obtain the coordinates from the online map or GPS service.

For example, in Google Maps, right-click on the point and then click on the coordinates. The point's latitude and longitude coordinates are copied to the clipboard. Paste the coordinates into the calibration point's **Lat** and **Lon** settings.



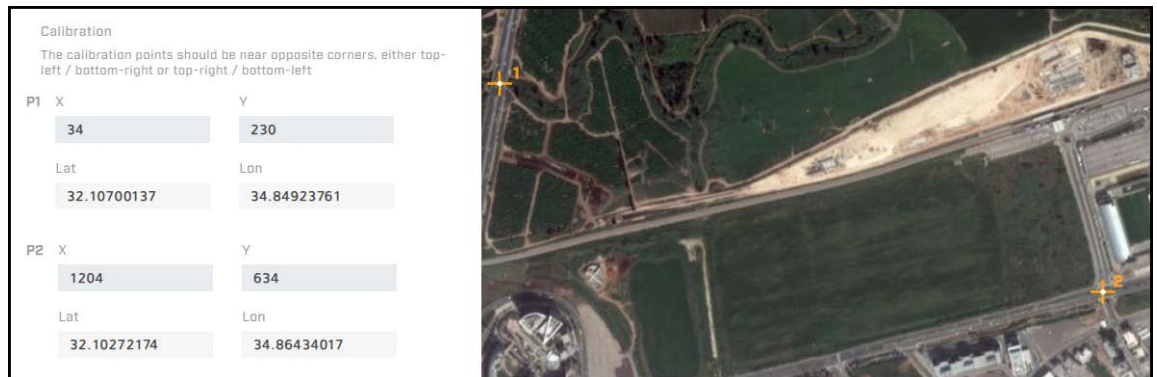
Right-click in Google Maps

Configuration

Step 6 Repeat steps 4 and 5 for the second calibration point (**P2**).

Step 7 Click **Save**.

The radar calibrates the map.



Calibration points defined and appearing on the reference map image

If you have not yet configured the radar's georeference settings, do so on the [Georeference Page](#).

4.6 Radar Settings Page

On the Radar Settings page, you can enable and configure Radar Fusion.

To provide full radar coverage for a sector, you might need two or more Elara R-Series Radars. You can configure one primary or master Elara R-Series Radar to fuse tracking information from one or more other secondary Elara R-Series Radars with its own tracking information.

For the primary radar to accurately fuse the tracking information, you need to configure accurate georeference information for the all fused radars on each radar's [Georeference Page](#).

Because the radars' fields of view might overlap, make sure the overlapping radars' radar frequencies do not interfere with each other. Configure a different chirp slot for each radar on the [Radar Page](#).

The screenshot shows the 'RADAR SETTINGS' page for 'R-290 405'. The 'Radar Fusion' section has an 'Enable' toggle set to 'On'. Below it is a 'Radar Sensor' table with an 'Add' button.

Radar Name	IP	Connected	Registered	Transmitting	Select
R-190 2510013	172.20.70.160	true	true	true	<input checked="" type="checkbox"/>
R-290 405	172.20.70.55	true	true	true	<input checked="" type="checkbox"/>

Annotations: 'Fused radar' points to the first row, and 'This radar' points to the second row. A 'Refresh' button is at the bottom right.

Configuration

Enable Radar Fusion. Then, select this Elara R-Series Radar and one or more other Elara R-Series Radars to fuse with this radar. You can also manually specify the IP address of another radar, add it, and select it to be fused to be fused with this radar. Click **Save**.

Enable Radar Fusion and configure alarm regions on only one radar. When fused with a primary radar, secondary radars do not pass alarm region information to the primary radar.

4.7 Firmware & Info Page

On the Firmware & Info page, you can:

- Specify a unique name for the radar
- Upgrade the radar's firmware
- Reset the radar to its factory defaults
- Reboot the radar
- Define a log level and download system information

The screenshot shows the 'FIRMWARE & INFO' page for a radar device. The page is divided into several sections:

- Device Information:** Displays 'Name' as R-190 2510013, 'Serial Number' as 2510013, 'Model' as R-190, 'MAC Address' as 00:40:7F:43:F9:BE, and 'Up Time' as 0 day(s) 00:09:54.
- Upgrade Firmware:** Includes a 'Find file' input field with an upload icon and an 'UPGRADE' button. A warning message states: 'Before upgrading, make sure the device has been recently rebooted'.
- Factory Default Reset and Camera Reboot:** Features three buttons: 'FULL RESET', 'PARTIAL RESET', and 'REBOOT'.
- Support System Info:** Contains a 'DOWNLOAD' button.
- Log Level:** A dropdown menu is currently set to 'Off'.

Name

Enter a unique, friendly name for the radar, using only alphanumeric characters. The default name for the radar is the model (R-x90) followed by its serial number.

R-290 405 — Radar name

FIRMWARE & INFO

Enter radar name

Firmware Version

Name R-290 405

To upgrade the radar's firmware:

- Step 1 Make sure the radar has been recently rebooted.
- Step 2 Under Upgrade version, click **Find file**.
- Step 3 On your computer or network, browse to and select the firmware file.

Caution!

Only upgrade to firmware developed for the Elara R-Series Radar.

- Step 4 Click **Upgrade**.

The radar uploads and installs the firmware, which takes a minute or two. After installing firmware, the radar requires a reboot. When prompted, confirm rebooting the radar.

Factory Defaults

Click **Full Reset** to return the radar its original factory configuration.

Click **Partial Reset** to maintain network and IP settings while returning all other settings to the factory configuration.

Click **Reboot** to cause the radar to power cycle and reinstall configuration files.

Tip

You can also return the radar to its original factory configuration by pressing the radar's physical hardware reset button for at least 20 seconds; for example, if you are unable to access the radar via its web page or other communication method. The hardware reset button is located on the radar assembly's back panel (see [Figure 2](#)).

Support System Info

To retrieve the radar's log files, click **Download**.

You can enable logs and define the log level; a higher log level increases the size of the log file.

5 Maintenance and Troubleshooting Tips

If help is needed during the installation process, contact the local Teledyne FLIR representative, or visit Teledyne FLIR Support at <https://support.flir.com/>.

5.1 Cleaning

Rinse the radar housing with low pressure fresh water to remove any salt deposits and to keep it clean.

5.2 Troubleshooting

Unable To Communicate Over Ethernet

First check to ensure the physical connections are intact and that the radar is powered on.

By default, the radar broadcasts a discovery packet twice per second. Use the FLIR Discovery Network Assistant (DNA) or a packet sniffer utility such as Wireshark and confirm the packets are being received by the PC from the radar.

Unable to View Radar Display Video Stream

If the video stream from the radar does not appear, it could be that the packets are blocked by the firewall, or there could be a conflict with video codecs that are installed for other video programs.

When displaying video with a VMS for the first time, the Windows Personal Firewall may ask for permission to allow the video player to communicate on the network. Select the check boxes (domain/private/public) that are appropriate for the network.

If necessary, test to make sure the video from the radar can be viewed by a generic video player such as VLC media player (<http://www.videolan.org/vlc/>). To view the video stream, specify RTSP, the radar's IP address, port 554, and the stream name, *map*. For example: **rtsp://192.168.0.250:554/map**.

RTSP authentication is enabled. To access any of the radar's video streams, use the name and password for any of the radar's users. See [Users Page](#).

Refer to [Video Page](#) for additional information on stream settings.



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