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# Installation and User Guide

## Elara™ Radar R-290

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Support: <https://www.flir.com/support/>.

### Important Instructions and Notices to the User:

This device complies with part 15 of the FCC Rules and ISSED'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 ISSED. 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 ISSED 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 ISSED 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 FLIR Systems, Inc. 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.

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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 2020 | Initial release of Elara Radar |

# Table of Contents

---

## Radar Overview

|                               |   |
|-------------------------------|---|
| 1.1 Supplied Components ..... | 2 |
| 1.2 Additional Supplies ..... | 2 |
| 1.3 Specifications .....      | 3 |

## Installation

|                                                                       |    |
|-----------------------------------------------------------------------|----|
| 2.1 Configuring the Radar for Networking .....                        | 5  |
| 2.2 Radar Placement and Orientation .....                             | 9  |
| 2.3 Site Preparation .....                                            | 11 |
| 2.4 Installing the Wall Mount Bracket .....                           | 11 |
| 2.5 Connecting the Radar and Installing the Back Box .....            | 12 |
| 2.6 Installing the Radar Assembly .....                               | 14 |
| 2.7 Uploading a Map Image and Configuring Georeference Settings ..... | 14 |
| 2.8 Aiming the Radar and Testing Target Detection .....               | 15 |
| 2.9 Defining Analytics Regions .....                                  | 15 |
| 2.10 Pairing a PTZ Camera with the Radar (Optional) .....             | 15 |
| 2.10.1 Open the camera's web page and select the radar .....          | 15 |
| 2.10.2 Enable and Configure an Automatic Radar Mode .....             | 16 |

## Operation

|                                     |    |
|-------------------------------------|----|
| 3.1 Accessing the Elara Radar ..... | 19 |
| 3.2 View Settings Home Page .....   | 20 |
| 3.3 Video Page .....                | 21 |
| 3.4 Radar Page .....                | 22 |
| 3.5 Georeference Page .....         | 24 |

## Configuration

|                                                 |    |
|-------------------------------------------------|----|
| 4.1 Network Page .....                          | 25 |
| 4.2 Date & Time Page .....                      | 26 |
| 4.3 Users Page .....                            | 27 |
| 4.4 Cyber Page .....                            | 29 |
| 4.4.1 Certificates .....                        | 29 |
| 4.4.2 IEEE 802.1X-Compliant Communication ..... | 30 |

---

|                                                                            |    |
|----------------------------------------------------------------------------|----|
| 4.4.3 Transport Layer Security (TLS) and Secure HTTP (HTTPS) Communication | 31 |
| 4.4.4 Other Cybersecurity Services .....                                   | 31 |
| 4.5 Map Page .....                                                         | 32 |
| 4.6 Radar Fusion Page .....                                                | 34 |
| 4.7 Firmware & Info Page .....                                             | 35 |
| <b>Maintenance and Troubleshooting Tips</b>                                |    |
| 5.1 Cleaning .....                                                         | 37 |
| 5.2 Troubleshooting .....                                                  | 37 |

The Elara 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 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 ONVIF<sup>1</sup>. For a list of supported VMS clients, refer to the individual product web page at [FLIR.com](https://www.flir.com).

The radar's display is viewed by streaming it as video over an IP network using M-JPEG encoding.

The Elara Radars are components within the FLIR Thermal Fence, which combines FLIR Elara Radars, thermal security cameras, and control and management software in a fully integrated perimeter security solution. The FLIR Thermal Fence provides automated perimeter surveillance, intrusion detection, and alert capabilities for perimeter security applications. The FLIR Thermal Fence gives you instant, automated threat detection and visual threat assessment capability around the clock in one easy-to-use package.

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

For safety, and to achieve the highest levels of performance from the Elara 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 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 Radar outside of the specified input voltage range or the specified operating temperature range can cause permanent damage.

No user serviceable components are inside.

External connections (trigger, relay, audio) are not user accessible.

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1. ONVIF is a trademark of Onvif, Inc.

### 1.1 Supplied Components

The Elara Radar kit includes these standard components:



### 1.2 Additional Supplies

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

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

## 1.3 Specifications

|                    | Specification          | Unit                    | Elara Radar Model R-290                                                                                                                |            |
|--------------------|------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------|
| Performance        | Radar FOV              | °                       | 90 x 30                                                                                                                                |            |
|                    | Radar Frequency        | GHz                     | USA: 24.075-24.175 GHz ISM Band                                                                                                        |            |
|                    |                        |                         | Europe: 24.000-24.250 GHz ISM Band                                                                                                     |            |
|                    | RF Transmit Power      | dBm                     | FCC: 14 (0.025W)                                                                                                                       |            |
|                    |                        |                         | EU: 6 (0.005W)                                                                                                                         |            |
|                    | Radar Detection Range  | meters                  | FCC                                                                                                                                    | Human: 250 |
|                    |                        |                         |                                                                                                                                        | Car: 600   |
|                    |                        |                         | EU                                                                                                                                     | Human: 150 |
|                    |                        |                         |                                                                                                                                        | Car: 300   |
|                    | Target Detection Speed |                         | Minimum: 0.1 m/sec<br>Maximum: > 100 km/h                                                                                              |            |
|                    | Number of Tracks       |                         | 64                                                                                                                                     |            |
|                    | Range Resolution       | meters                  | FCC: 1.5                                                                                                                               |            |
|                    |                        |                         | EU: 0.6                                                                                                                                |            |
|                    | Distance Accuracy      | meters                  | < 1                                                                                                                                    |            |
|                    | Azimuth Accuracy       | °                       | 0.6                                                                                                                                    |            |
|                    | Sensor Scan Rate       | Hz                      | 10 Hz, 5 Hz, or 2 Hz (user-configurable)                                                                                               |            |
|                    | Coverage               | Acres (m <sup>2</sup> ) | FCC Human Detection: 12 acres (48,500 m <sup>2</sup> )                                                                                 |            |
|                    |                        |                         | EU Human Detection: 4 acres (16,000 m <sup>2</sup> )                                                                                   |            |
|                    | Object Data            |                         | GPS coordinates, velocity, RCS, range, azimuth angle/direction, heading, course/track, doppler width, object type, target ID, duration |            |
|                    | Object Classification  |                         | Human, vehicle                                                                                                                         |            |
|                    | Analytics              |                         | Embedded tracker and classifier                                                                                                        |            |
|                    | Data Streaming         |                         | All object data                                                                                                                        |            |
| Interface          | Wi-Fi Range            | meters                  | 50                                                                                                                                     |            |
|                    | GPS Spec               |                         | TBD                                                                                                                                    |            |
| System Integration | Pan Range              | °                       | +/- 43°                                                                                                                                |            |
|                    | Tilt Range             | °                       | +30° / -60°                                                                                                                            |            |
|                    | Number of I/O          |                         | 1 in, 1 out (isolated, 4 conductors)                                                                                                   |            |
| System Integration | Connectors             |                         | 10/100 Ethernet<br>I/O and power terminal block                                                                                        |            |
|                    | Connectivity           |                         | 10/100 Ethernet                                                                                                                        |            |
|                    | Network APIs           |                         | FLIR SDK, FLIR CGI, ONVIF Profile S                                                                                                    |            |
| System Integration | Supported Protocols    |                         | AXML, XML, KML, Google Earth                                                                                                           |            |

## Radar Overview

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|                      |                       |      |                                    |
|----------------------|-----------------------|------|------------------------------------|
| <b>Installation</b>  | Features              |      | Minimize installation tools        |
|                      |                       |      | Blind mate                         |
|                      |                       |      | Position lock                      |
| <b>Mechanical</b>    | Weight                | Lbs. | <10                                |
|                      | Height                | in.  | 6.5                                |
|                      | Width                 | in.  | 6.5                                |
|                      | Depth                 | in.  | 7.75                               |
| <b>Environmental</b> | Operating Temperature | °C   | -40°C to 70°C continuous operation |
|                      | Storage Temperature   | °C   | -50°C to 85°C                      |
|                      | IP Rating             |      | IP66                               |
|                      | Dust/Sand (Operating) |      | IP66                               |
|                      | Wind Loading          | mph  | No slip at 100                     |
| <b>Power</b>         | Input Voltage         |      | 12 VDC, 24 VAC, and PoE            |
|                      | Power Consumption     | W    | <25                                |

# 2 Installation

Installing the Elara Radar consists of:

- Step 1 [Configuring the Radar for Networking](#)
- Step 2 [Radar Placement and Orientation](#)
- Step 3 [Site Preparation](#)
- Step 4 [Installing the Wall Mount 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 Analytics Regions](#)
- Step 10 [Pairing a PTZ Camera with the Radar \(Optional\)](#)

## 2.1 Configuring the Radar for Networking

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

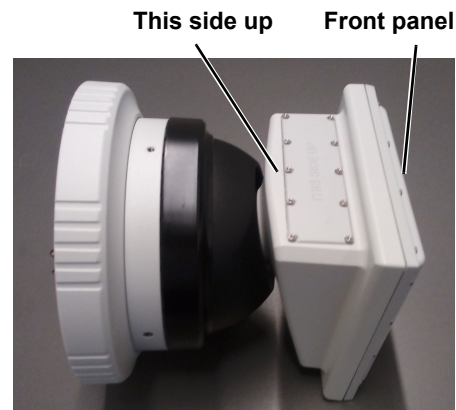
By default, Dynamic Host Configuration Protocol (DHCP) is enabled on the radar and a DHCP server on your network assigns the radar an IP address. If there is no DHCP server on the network, the radar's IP address defaults to 192.168.0.250 and the netmask defaults to 255.255.255.0.

You can specify another IP address for the radar and configure it for networking with the FLIR Discovery Network Assistant (DNA) software tool or with the radar's web page.

|                                                | 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 | •        |                  |

### To configure the radar for networking before mounting it:

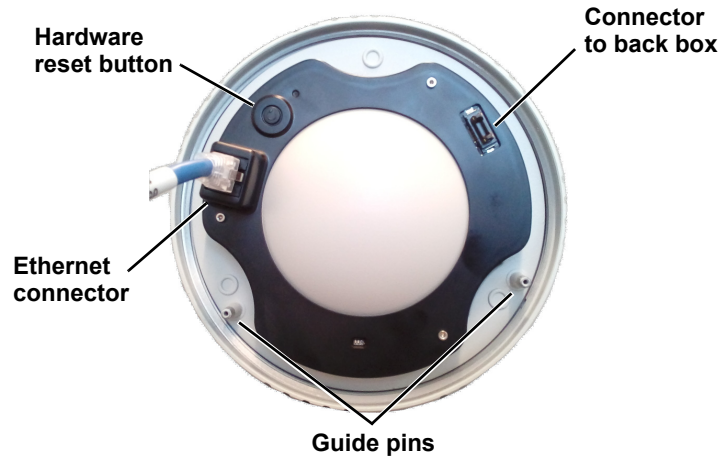
- Step 1 The radar assembly and the back box are shipped in separate boxes. Remove the radar assembly from its shipping box and place it on a table, desk, or other flat surface with the THIS SIDE UP marking on the radar assembly facing up.



### 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 Power over Ethernet (PoE) switch or injector, connect an Ethernet cable to the Ethernet connector on the radar assembly's back panel.



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

### To configure the Elara 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-290) and name. The default name is R-290 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's web page on [FLIR.com](https://www.flir.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.

The screenshot shows the FLIR DNA tool interface. At the top is a navigation bar with icons for IP Setup, Login, Firmware, Admin, Properties, and Export. Below this is a toolbar with buttons for Refresh, Add Device Manually, and Select All. A filter dropdown is set to 'Device Type'. The main area is a table with columns: Device Type, Model name, Status, Login status, IP address, Name, and Firmware version. The table lists various devices, with the 'R-290' model highlighted in blue. At the bottom, it shows 'Number of devices : 42'.

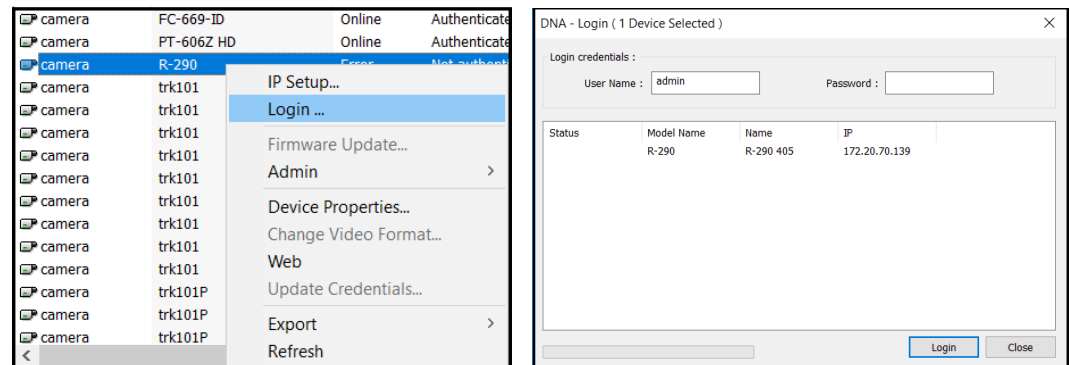
| Device Type | Model name | Status | Login status      | IP address    | Name              | Firmware version    |
|-------------|------------|--------|-------------------|---------------|-------------------|---------------------|
| camera      | FC-669-ID  | Online | Authenticated     | 172.20.70.152 | FC-669-ID 666     | TX E2.05.20-SUPPORT |
| camera      | PT-606Z HD | Online | Authenticated     | 172.20.70.19  | PT-606Z HD 450142 | v1.3.0.12           |
| camera      | R-290      | Error  | Not authenticated | 172.20.70.139 | R-290 405         | v1.0.0.13           |
| camera      | trk101     | Online | Authenticated     | 172.20.70.29  | ioibox trk101     | 2.4.0.23            |
| camera      | trk101     | Online | Authenticated     | 172.20.70.180 | ioibox trk101     | 2.1.3.149           |
| camera      | trk101     | Online | Authenticated     | 172.20.70.182 | ioibox trk101     | 2.3.0.2             |
| camera      | trk101     | Online | Authenticated     | 172.20.70.185 | ioibox trk101     | 2.3.0.2             |
| camera      | trk101     | Online | Authenticated     | 172.20.70.186 | ioibox trk101     | 2.3.0.10            |
| camera      | trk101     | Online | Authenticated     | 172.20.70.188 | ioibox trk101     | 2.3.0.2             |
| camera      | trk101     | Online | Authenticated     | 172.20.70.189 | ioibox trk101     | 2.1.2.132           |
| camera      | trk101     | Online | Authenticated     | 172.20.70.191 | ioibox trk101     | 2.3.0.2             |
| camera      | trk101     | Online | Authenticated     | 172.20.70.192 | Shai P            | 2.0.1.304           |
| camera      | trk101P    | Online | Authenticated     | 172.20.70.135 | IMX 290 OUTSIDE   | 2.3.0.12            |
| camera      | trk101P    | Online | Authenticated     | 172.20.70.181 | pt hd             | 2.3.0.2             |
| camera      | trk101P    | Online | Authenticated     | 172.20.70.184 | Shai S HTTPS      | 2.4.0.23            |

## Installation

### 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**.

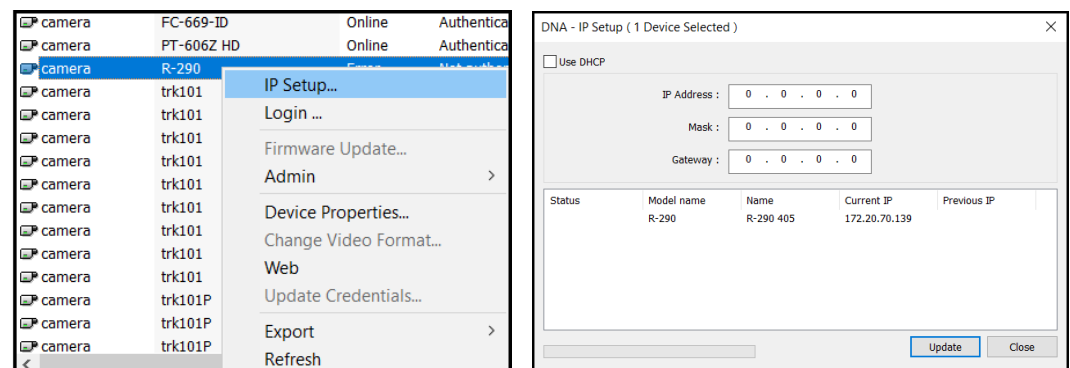


In the DNA Discover List, verify that the radar's status is *Online* and *Authenticated*.

### 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.



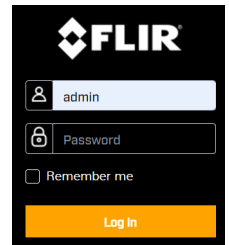
### To configure the Elara Radar for networking using its web page:

**Step 1** Open the radar's web page either by double-clicking the radar in the DNA Discover List or by typing the radar's IP address in a web browser's address bar. The radar's web page supports the latest versions of popular web browsers.

## Installation

- Step 2 On the login screen, type *admin* for the user name and the password for the admin user (default: *admin*).

When logging in to the radar's web page for the first time or for the first time after performing a factory default, specify a new password for the admin user. 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 image shows the FLIR login interface. It features the FLIR logo at the top. Below it, there are two input fields: one for the username labeled 'admin' and one for the password labeled 'Password'. There is a 'Remember me' checkbox below the password field. At the bottom, there is a yellow 'Log In' button.

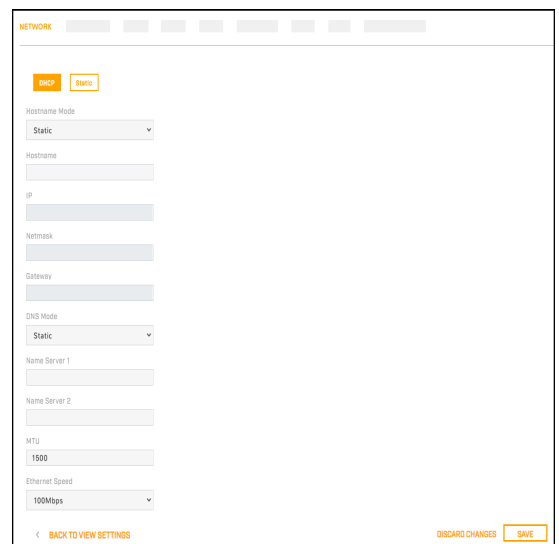
Log back in with the new password. The radar's View Settings home page opens.



- Step 3 Click **System Settings**, and make sure the Network page appears.
- Step 4 You can click *Static* IP addressing and manually specify the radar's *Hostname*, *IP*, *Netmask*, and *Gateway*. You can also specify the *DNS Mode*, *Name Servers*, and *MTU* (maximum transmission unit).

For more information about these settings, see [Network Page](#).

- Step 5 Click **Save**. The radar reboots to apply the new settings.

The image shows the 'Network' settings page in the FLIR radar web interface. The page has a 'Static' tab selected. It contains several input fields for network configuration: 'Hostname Mode' (set to 'Static'), 'Hostname', 'IP', 'Netmask', 'Gateway', 'DNS Mode' (set to 'Static'), 'Name Server 1', 'Name Server 2', 'MTU' (set to '1500'), and 'Ethernet Speed' (set to '100Mbps'). At the bottom, there are three buttons: 'BACK TO VIEW SETTINGS', 'DISCARD CHANGES', and 'SAVE'.

### 2.2 Radar Placement and Orientation

The Elara 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

Mount the radar in a location where it has an unobstructed view of the area to be monitored. Understanding that it might not be possible to get an unobstructed line of sight out to the instrumented range, select the mounting location to maximize the area the radar can monitor.

Consider terrain contour. FLIR recommends pointing the radar at an angle aligned with the general slope of the terrain under surveillance. Also consider seasonal vegetation changes; and potential obstruction from ground vehicles such as cars, trucks and trains, as well as aircraft and ships, because it may change over time.

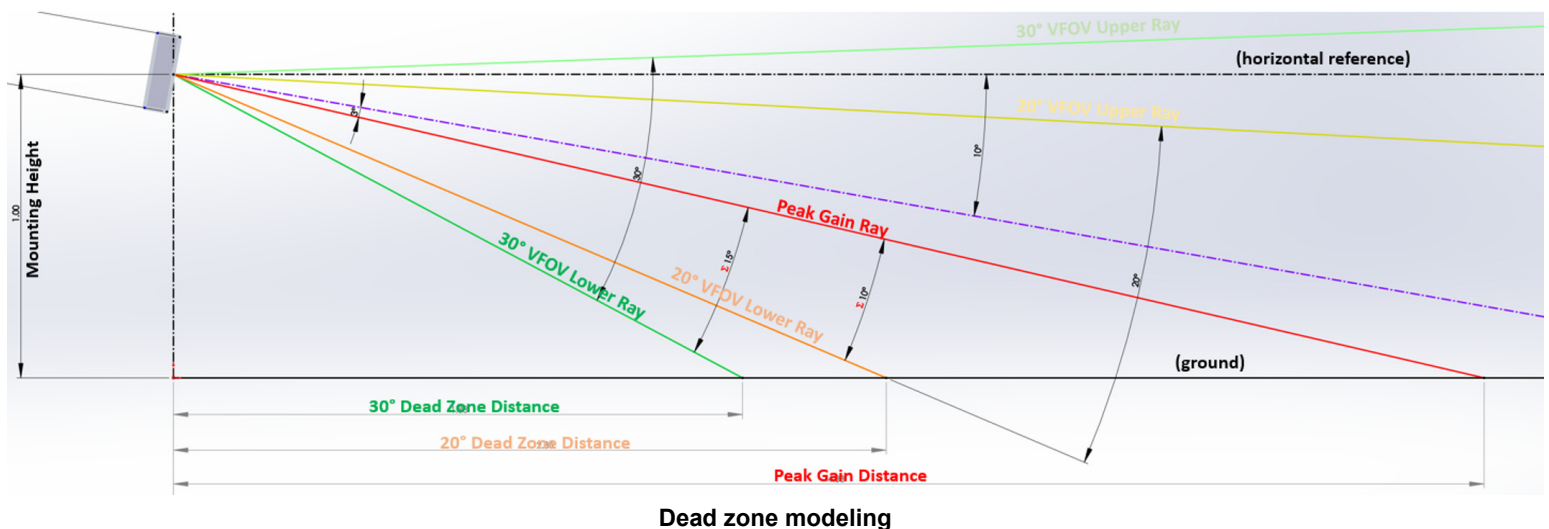
FLIR recommends installing the Elara Radar at a height of approximately 2 m (6.5 ft) or higher.

In addition to the line of sight considerations, there shouldn't be any large metallic object or structure in front of the radar within the first 100 meters (330 ft) over a 180° azimuth sector. It should also face away from walls or fences that can cause reflections.

#### Important

Do not point the radar at metallic surfaces that are closer than one meter away.

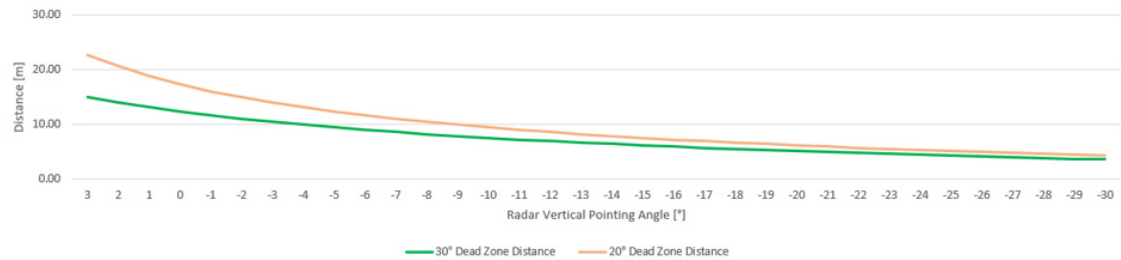
Peak gain for the radar is at  $-3^\circ$ , which appears as Peak Gain Ray in the dead zone modeling diagram below. It is slightly below the vertical pointing angle (the purple line in the diagram). Therefore, for optimum detection distance, locate and aim the radar so that the farthest targets coincide with the Peak Gain Ray, which appears as Peak Gain Distance in the diagram.



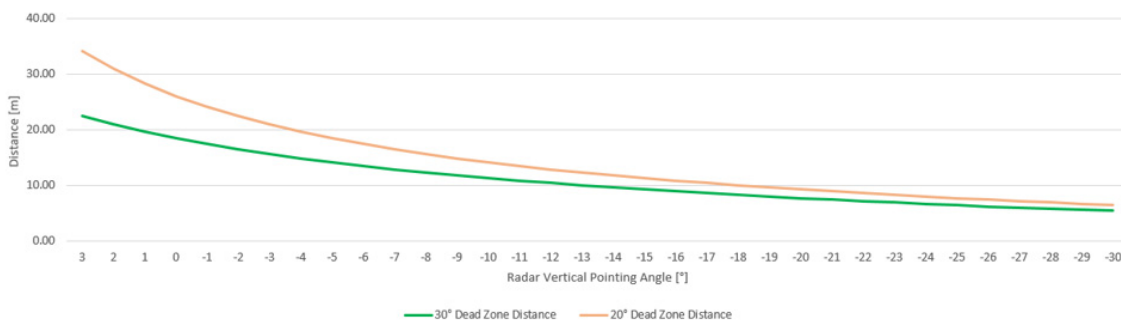
## Installation

To improve detection of closer targets, you can aim the radar lower, at the expense of detecting targets further away. For example, at a road intersection when detecting close-range pedestrians and cyclists is more important than detecting cars 500 meters away.

The diagrams below show the radar's dead zone distances according to vertical pointing angle at mounting heights of 4 m and 6 m (20 ft). The distances are for flat ground with no slope.



**Dead zone distances vs. vertical pointing angle - 4 m mounting height**



**Dead zone distances vs. vertical pointing angle - 6 m mounting height**

To provide full radar coverage for a sector, the ranges of two or more radars might overlap. After you configure them so that their radar frequencies do not interfere with other on the [Radar Page](#), you can configure an Elara Radar to fuse tracking information from one or more other Elara Radars with its own tracking information; see the [Radar Fusion 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 directly on a wall or, using an optional mounting accessory, in a corner or onto a pole. Ensure that the radar is on a stable mount with minimal vibrations and resistance to wind. For information about the mounting accessories available for the Elara Radar, see the *FLIR Security Cameras - Accessory Guide*.

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.

### 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 and the FLIR logo on the flat front panel is upright.

## 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. Avoid exposure to direct sunlight.
- **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 Installing the Wall Mount Bracket

The wall mount bracket fits standard electrical boxes. For surface mounting, route the conduit into the side opening of the back box.



Wall mount bracket



Twist-lock screws in back box

Step 1 Remove the back box cover by unscrewing it from the back box.

## Installation

- Step 2 The wall mount bracket is shipped attached to the back box. Using the screwdriver, unscrew the three quarter-turn twist-lock screws to release the wall mount bracket.
- Step 3 Using the appropriate screw holes marked on the wall mount bracket, secure it to the electrical box.

### 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 Power over Ethernet (PoE) or with a conventional 24 VAC or 12 VDC power supply. The Elara Radar is a Powered Device compliant with the IEEE 802.3af-2003 standard. To use PoE, connect the radar to either a IEEE 802.3af-2003 standard PoE switch or a PoE injector.

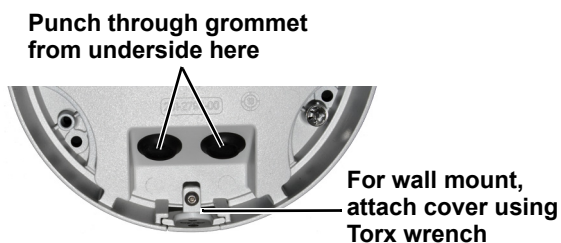
The maximum Ethernet cable run is 100 meters, including the PoE power supply. Installations using PoE and IP video only require a single Ethernet cable connection.

#### Grounding

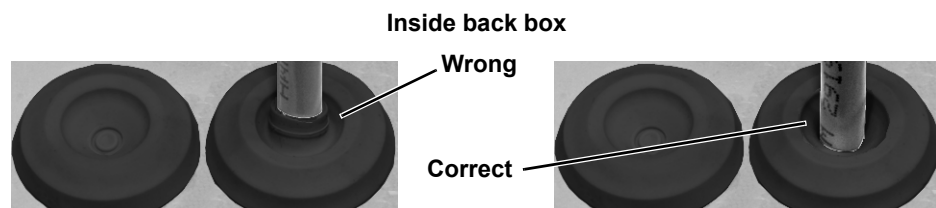
Ensure the radar is properly grounded. Failure to properly ground it can lead to permanent damage to the radar. Typical to good grounding practices, the radar back box chassis ground should be connected to the lowest resistance path possible.

#### To connect the Elara Radar and install the back box:

- Step 1 Ensure the power supply or circuit breaker is off.
- Step 2 For each cable, use the Torx wrench to punch a hole in the center of the grommet from the underside. Insert the cable from the conduit though the hole.



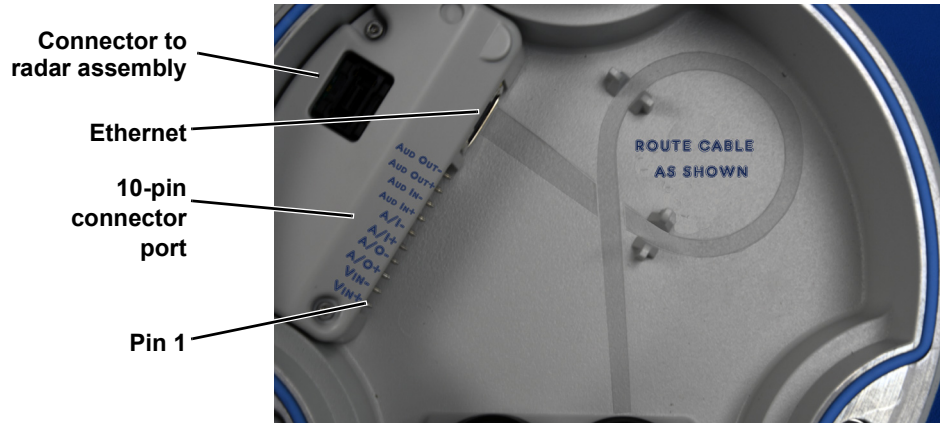
- Step 3 Push the cable back through the seal so the seal extends out of the back box, as shown:



- Step 4 Seal all exposed connections. Cable connections are not waterproof.

## Installation

Step 5 Route the Ethernet cable inside the back box as shown below.



| Connector        | Connection                                                                                                                |
|------------------|---------------------------------------------------------------------------------------------------------------------------|
| Ethernet         | Power and IP communications                                                                                               |
| 10-pin connector | Power and I/O terminal: VAC or VDC power, along with future release support for alarm I/O and audio I/O (see table below) |

Step 6 (Optional) If you are using the 10-pin connector, terminate cables and plug into connectors.

### 10-Pin Power & I/O Connector

| Pin | Connection      | Notes                                                  |
|-----|-----------------|--------------------------------------------------------|
| 1   | VAC/VDC power + | 12 VDC/24 VAC optional power when PoE is not available |
| 2   | VAC/VDC power - |                                                        |
| 3   | Alarm Output +  | Future release support                                 |
| 4   | Alarm Output -  |                                                        |
| 5   | Alarm Input +   | Future release support                                 |
| 6   | Alarm Input -   |                                                        |
| 7   | Audio In +      | Future release support                                 |
| 8   | Audio In -      |                                                        |
| 9   | Audio Out +     | Future release support                                 |
| 10  | Audio Out -     |                                                        |

Step 7 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.

Make sure the THIS SIDE UP marking and the FLIR logo on the radar assembly's front panel face up.

#### 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

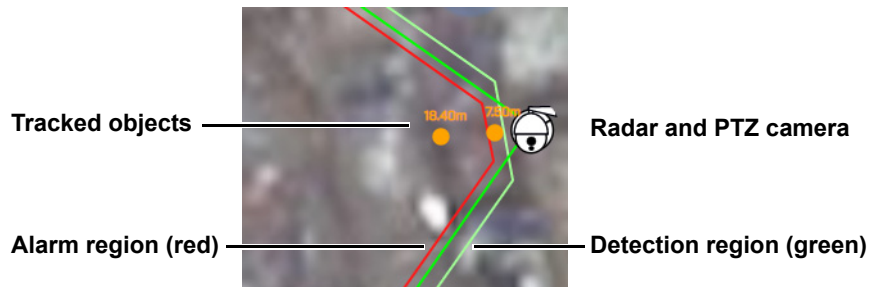
Upload a reference map image upon which the radar will overlay its display. Uploading a map makes aiming the radar easier and also makes the radar display more useful to operators. To upload a map and configure the radar's georeference settings, you need to access the radar's web page.

- Step 1 Access the radar's web page by doing one of the following:
- In the DNA tool, double-click the radar in the DNA Discovery List.
  - Type the radar's IP address in a browser's address bar (when the PC and the radar are on the same network).
- Log in using the admin user and password (default: *admin*). The View Settings home page appears.
- Step 2 Click **System Settings**, open the [Map Page](#), and then upload and calibrate a map image.
- Step 3 Click **Back to View Settings**, open the [Georeference Page](#), and specify the radar's latitude, longitude, and orientation.

### 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 field of view.
- Step 2 On the Radar page, under Radar Mode, click **On**.
- Step 3 Have a person walk in a straight line directly away from and the back towards the radar. Verify the detection track appears in the radar display.

The following image shows an Elara Radar tracking two objects within previously defined detection and alarm regions, and with a compatible FLIR PTZ camera mounted at the same position as the radar:



- Step 4 Tighten the two set screws and verify the camera's orientation setting.

### 2.9 Defining Analytics Regions

Open the [Radar Page](#) and define alarm, exclusion, or detection regions.

#### 2.10 Pairing a PTZ Camera with the Radar (Optional)

Users assigned the expert or admin role can pair the following FLIR Security PTZ cameras (firmware **v1.6.1.0**) to work with the Elara Radar, so that the camera follows targets detected and tracked by the radar:

| Visible Security Cameras          | Multispectral Thermal Cameras |
|-----------------------------------|-------------------------------|
| Quasar 4K 22x IR-PTZ CP-6408-21-I | DM-Series                     |
| Quasar 4K 33x IR-PTZ CP-6408-31-I | DX-Series                     |

#### Important

The video tracking and advanced radar integration relies on accurate geographic location information for the radar and for the camera. On both the radar's and the camera's Georeference pages, make sure the settings are accurate.

Use the *camera's* web page to pair the radar with a camera and enable an automatic radar mode. **The computer you are using to access the camera's web page must have access to the internet.**

#### 2.10.1 Open the camera's web page and select the radar

- Step 1 Log in to the camera's web page. For information about accessing the camera's web page, see the camera's installation and user guide.

Step 2 Click **System Settings** and then on the navigation bar, click **Radar**.

| Device Name | IP            | Port | Select |
|-------------|---------------|------|--------|
| R-290 405   | 172.20.70.139 | 1001 | ⦿      |

Step 3 To activate the radar settings, click **On**.

Step 4 From the list of devices on the same LAN segment as the camera, select the radar to pair with the camera.

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

Make sure the radar's IP address and port appears next to Radar Sensor.

Step 5 Click **Save**.

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

### 2.10.2 Enable and Configure an Automatic Radar Mode

Step 1 In View Settings, open the PTZ page.

Step 2 From the Radar Modes list, select one of the following:

- **None**—Radar tracks do not affect the camera.
- **Track Scan**—The camera performs a tour scanning all existing radar tracks. It follows each track for a specific amount of dwell time.
- **Engage Last**—The camera follows the most recently detected radar track.
- **Engage Closest**—The camera follows the track closest to the radar.

Radar Modes

- None
- None
- Track Scan
- Engage Last
- Engage Closest

Step 3 When any radar mode is selected, you can lock the camera to follow the currently engaged track. Under Track, click **Lock**. The camera will not move to another radar track until: you click **Unlock**, the current track disappears, or it no longer meets the conditions.

Step 4 Open **Advanced Settings**.

Step 5 From the Startup Mode list, select one of the following:

- **None**—The camera starts up in manual mode.
- **Tour**—The camera starts up in Tour mode.
- **Track NMEA**—The camera starts up in a maritime-specific mode that points the camera to radar tracks, waypoints, or MFD cursor position.
- **Track Scan**—The camera starts up in the radar Track Scan mode.
- **Track Last**—The camera starts up in the radar Engage Last mode.
- **Track Closest**—The camera starts up in the radar Engage Closest mode.

Step 6 Specify a Dwell Time between 0-100 seconds. When the Track Scan radar mode is active, the camera stays on each radar track for the specified dwell time.

Step 7 Under Field of View Adjustment, select one of the following:

- **Disabled**—The radar does not affect the camera's zoom.
- **Enabled**—The distance from the object tracked by the radar determines the camera's zoom.

Step 8 To enable Only Alarm Tracks so that only alarms from the radar affect the camera, click **On**, select one of the following, and then click **Set**:

- **All Areas**—Tracks from all alarm regions affect the camera.
- **Areas**—Specify the alarm regions whose tracks affect the camera. To specify specific regions and ranges of regions, you can use a comma. For example, you can specify 1, 3-5.

Step 9 Select one of the following for Idle State Mode, which determines the behavior of the camera when it is in a radar track mode and there is no track to engage:

- **None**—Camera stays at the current position.
- **Home Position**—Camera moves to its home position.
- **Preset**—Camera moves to the specified preset.

Step 10 Select one of the following for User actions during automatic modes, which determines the behavior of the camera behaves when it is in an automatic mode and a user performs a manual action such as moving, zooming, or focusing the camera:

- **None**—Manual commands are not allowed and are ignored.

The screenshot shows the 'Advanced Settings' menu with the following options:

- Startup Mode:** A dropdown menu currently set to 'None'.
- Mechanical Flip:** Two buttons, 'On' and 'Off', both of which are currently disabled (greyed out).
- Radar Mode Settings:**
  - Dwell Time (0 sec.-100 sec.):** A slider control set to 10.
  - Field of View Adjustment:** Two buttons, 'Enable' and 'Disable', both of which are currently disabled.
  - Only Alarm Tracks:** Two buttons, 'On' and 'Off', both of which are currently disabled.
- Idle State Mode:** A dropdown menu currently set to 'None'.
- User actions during automatic modes:**
  - Mode:** A dropdown menu currently set to 'Exit'.

- **Exit**—The camera exits the automatic mode and performs the manual action.
- **Exit and Come Back**—The camera exits the automatic mode, performs the manual action, and then returns to the automatic mode after the specified amount of time has passed (Timeout Interval) following a manual command.

These settings take immediate effect and are saved. You do not have to click **Save**.

# 3 Operation

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

## 3.1 Accessing the Elara Radar

To operate the radar, you first need to access it. Access the radar by logging in to the radar's web page.

### 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-290, and name. The default name is R-290 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**.

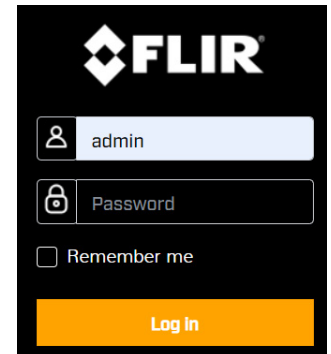
When logging in to the radar's web page for the first time or for the first time after resetting the radar to its factory defaults, type *admin* for the user name and for the password.

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.

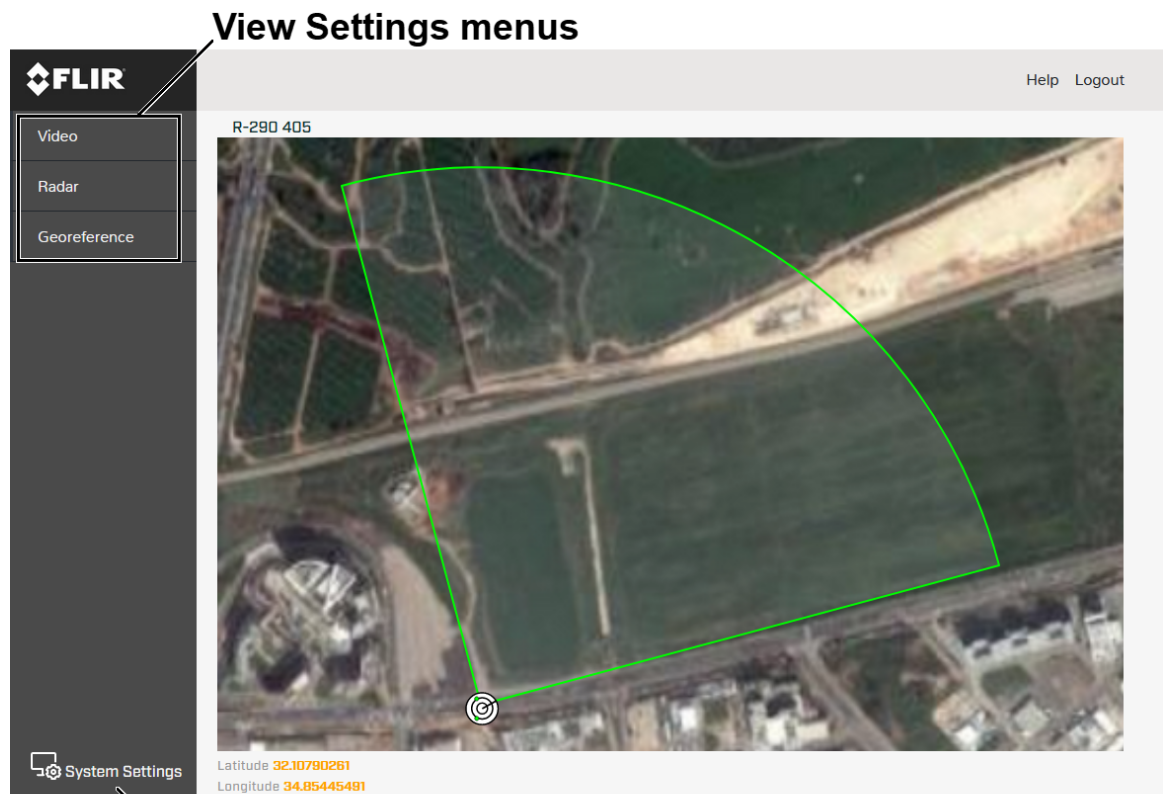
Use a strong password consisting of at least 12 characters and at least one uppercase letter, one lowercase letter, and one number. Passwords can include the following special characters: |@#~!\$%<>+ \_-.,\*?=. .

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



### 3.2 View Settings Home Page

The View Settings page displays the live radar. When a user assigned the expert or admin role logs in to the radar's web page, the page also displays View Settings menus along the left side banner and other options.



### System Settings

View Settings page for users assigned the admin or expert role

#### Live Radar

You can:

- Move the live radar display around by clicking on it and dragging it.
- Zoom in and out using the mouse wheel, when the mouse pointer is over the radar display.
- Center the map and show/hide the background reference map image by right-clicking on the radar display.

When the radar's geographical coordinates have been specified on the [Georeference Page](#) and the mouse pointer is over the radar display, the latitude and longitude of the mouse pointer 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 Video Page

On the Video page, you can:

- Select whether video stream or the map appears in the web page. Changing the Map Display immediately affects the web page.
- Modify the parameters of the radar's video stream.
- Edit the video stream frame.

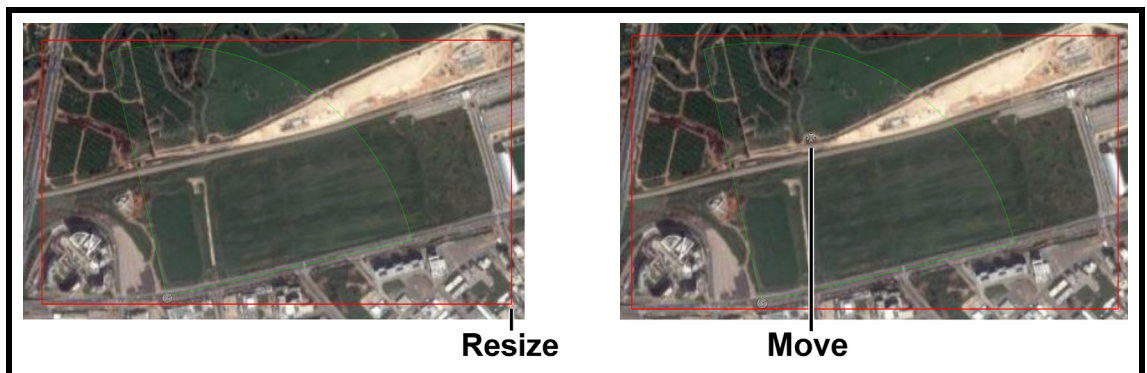
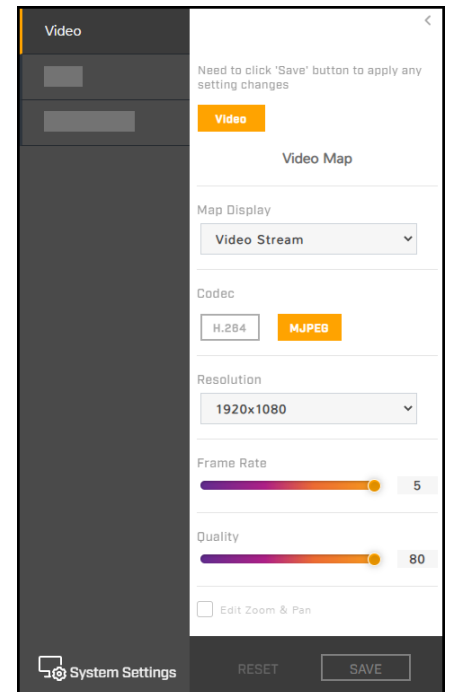
For Map Display, select Web. Then, select Edit Zoom & Pan. The video frame appears as an overlay in the live radar display.

#### Tip

When Edit Zoom & Pan is selected, the mouse pointer is used to define the video frame and it is not possible to zoom or move the live radar display.

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.

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



In general, it is not necessary to modify the Resolution, Frame Rate, and Quality settings. In some cases, such as when a video stream is sent over a wireless network, it might be useful to “tune” the video stream to reduce the bandwidth requirements. The video stream is available for viewing from a client program or third-party ONVIF systems.

By default, the radar provides a 1280x720, two frames per second (FPS) stream using the MJPEG codec. Higher resolution, frame rate, and 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.

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. Using the radar's default IP address, the URL is `rtsp://192.168.0.250:554/map`.

Accessing the radar's video stream requires authentication. You can use the name and password for any of the radar's users. See [Users Page](#).

To apply any change on the Video page, except to the Map Display setting, click **Save**.

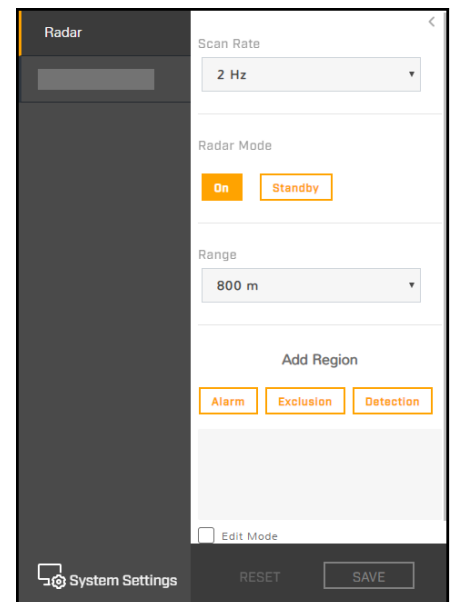
### 3.4 Radar Page

On the Radar page, you can define:

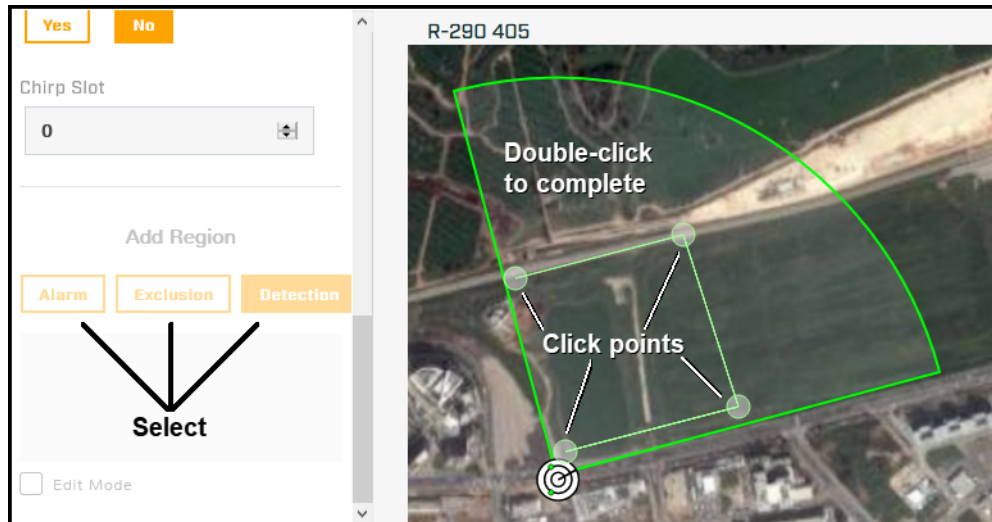
- The radar's scan rate: 2 Hz, 5 Hz, or 10 Hz

There is a correlation between scan rate, detection range, fast moving object detection, and tracking performance. 2 Hz provides more detection range and better human detection. 10 Hz provides less detection range, but better fast moving object detection and better tracking performance. For example, at the 10 Hz scan rate, the radar tracks fast traveling cars more accurately and declares those tracks more quickly.

- Whether the radar is On or in Standby mode.
- The radar's range: for US model, 800 m; for EU model, **selectable**.
- The radar's sensitivity: Low, Mid, or High. Lower sensitivity can reduce false alarms or small-object detection, but could miss some objects.
- Whether you are using this radar on its own or in conjunction with other radars. If you are using this radar in conjunction with one or more other radars, under Standalone, select No, and then define a Chirp Slot for this radar. Specify a unique chirp slot value for this radar to prevent interference from other radar beams.
- Alarm regions: Detection is enabled and alarms are triggered; appear in the radar display with red borders.
- Exclusion regions: Detection is disabled and alarms are not triggered; appear in the radar display with yellow borders.
- Detection regions: Detection is enabled but alarms are not triggered; appear in the radar display with pale green borders (the radar's range appears as bright green).

The image shows a mobile application interface for configuring a radar. The title bar at the top says "Radar". Below it, there's a "Scan Rate" section with a dropdown menu currently set to "2 Hz". The next section is "Radar Mode", featuring two buttons: "On" (highlighted in orange) and "Standby". Below that is the "Range" section with a dropdown menu set to "800 m". An "Add Region" section follows, containing three buttons: "Alarm", "Exclusion", and "Detection", all in orange. At the bottom of the configuration area is an "Edit Mode" checkbox, which is currently unchecked. The very bottom of the screen has a dark bar with a "System Settings" icon on the left and "RESET" and "SAVE" buttons on the right.

Changes made on the Radar page immediately take effect.

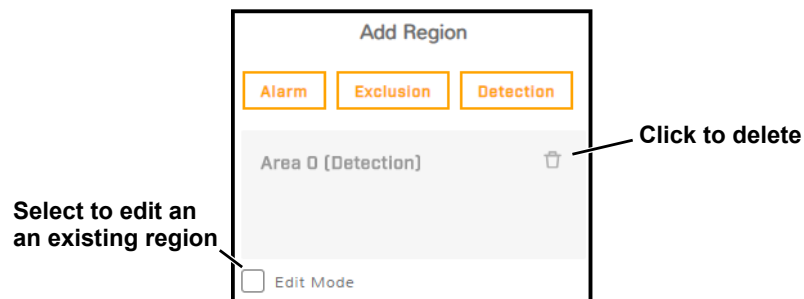


### To add an analytics region:

- Step 1 Click one of the **Add Region** options.
- Step 2 Click and release on the radar display to create the first corner of the region.
- Step 3 Continue adding corners (up to 16).
- Step 4 To complete the region, double-click on the radar display.
- Step 5 To define another region, repeat steps 1-5.

### Tips

- To make sure the radar detects objects and creates tracks before objects enter the alarm region, define the detection region larger than the alarm region.
- Exclusion regions can help eliminate alarms from a tree or bush moving in the wind, for example.
- To cancel creating an analytics region, press **Esc**.
- To move the points of an existing region, select **Edit Mode**, select the region, and then click and drag points to move them.
- To delete a region, select the region and click the trash can icon next to it.



### 3.5 Georeference Page

Use the Georeference page to specify the radar's geographical location and mounting position. Users assigned the admin or expert role can use the Georeference page in conjunction with the [Map Page](#) in System Settings, where you can upload and calibrate a reference map image.

Specify the Elara Radar's:

- **Installation Height**, in meters above the surrounding ground level (it must be greater than zero)
- **Orientation**, in degrees from North, between 0-360 degrees (required)

Then, scroll down to GPS Coordinates and click **Apply**. The radar's onboard GPS provides latitude, longitude, and ground altitude information.

You can also manually specify georeference information, or, if the map is properly calibrated, right-click on the map and then click **Georeference sensor**.

- **Latitude**, in degrees North or South (required)
- **Longitude**, in degrees East or West (required)
- **Ground Altitude**, in meters above sea level (must be greater than zero)

If you don't know the ground altitude or installation height, you can specify zero (0).

If you are using a Digital Elevation Model (DEM) and have uploaded it on the [Map Page](#), you can enable it by clicking **On**.

After making any change on the Georeference page, click **Save** to save the changes.

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

- Allows the user or an application to:
  - Show the radar on a map
  - Show the direction the radar is facing (using the radar's detection range, which the radar also reports)
- Supports cueing or showing:
  - Radar tracks
  - I/O alarms

The screenshot shows the 'Georeference' page in a web interface. It has a dark sidebar on the left with 'System Settings' at the bottom. The main content area is white and contains several input fields and buttons. The fields are: Latitude (32.099609), a dropdown for North (N), Longitude (34.853291), a dropdown for East (E), Ground Altitude (20 meters), Installation Height (0 meters), and Orientation (30 degrees). Below these is a 'Digital Elevation Model' section with a note 'A DEM file is needed to enable this mode' and 'On'/'Off' buttons. Further down, 'GPS Coordinates' are shown: Latitude 32.09953200 N, Longitude 34.85328367 E, Altitude (meters) 27, and Quality 1. An 'Apply' button is next to the GPS coordinates. At the bottom right are 'RESET' and 'SAVE' buttons.

# 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 Fusion Page](#)
- [Firmware & Info Page](#)

## 4.1 Network Page

When a user assigned the expert or admin role clicks **System Settings**, the Network page appears.

NETWORK

**DHCP** Static

Hostname Mode  
Static

Hostname

IP

Netmask

Gateway

DNS Mode  
Static

Name Server 1

Name Server 2

MTU  
1500

Ethernet Speed  
100Mbps

< BACK TO VIEW SETTINGS View Settings DISCARD CHANGES SAVE

The IP address mode can be set to DHCP (default) or Static.

When the IP address mode is DHCP, specify the Hostname Mode:

- **DHCP**—The DHCP server assigns the hostname, which identifies the radar on the network.
- **Static**—Specify the radar's hostname.

When the IP address mode is Static, specify:

- **IP**—The radar's IP address
- **Netmask**—The default value is 255.255.255.0

- **Gateway**

When the IP address mode is set to DHCP, if a DHCP server is not available on the network, the radar's IP address defaults to 192.168.0.250. For information about defining the radar's IP address using the DNA tool, see [Configuring the Radar for Networking](#).

**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.

When the IP address mode is DHCP, you can set the DNS Mode to DHCP or Static. When the IP address mode is Static, the DNS Mode is also Static.

When the DNS Mode is set to Static, 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

You can also specify the:

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

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

## Configuration

DATE & TIME

**Copy PC time**

**Select date pop-up**

Time Zone: America/Dawson, Los Angeles, Tijuana, Vancouver

Daylight Saving: On

Current time: 10:05:21 AM

PC Time: 10:05:27 AM 01/13/2020

Time: 10 04 49 AM PM

Date: 01/13/2020

January 2020

Su Mo Tu We Th Fr Sa

1 2 3 4

5 6 7 8 9 10 11

12 13 14 15 16 17 18

19 20 21 22 23 24 25

26 27 28 29 30 31

< BACK TO VIEW SETTINGS DISCARD CHANGES SAVE

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.

After setting the date and time parameters, click **Save** at the bottom of the page. The radar requires a reboot, and a confirmation prompt appears.

After setting the date and time, the radar will require a reboot. A confirmation prompt will appear.

### 4.3 Users Page

Admin level login privileges are required to add users and change or set all passwords.

USERS

| User Name | Role   | Actions |
|-----------|--------|---------|
| admin     | admin  |         |
| expert    | expert |         |

ADD USER

< BACK TO VIEW SETTINGS DISCARD CHANGES SAVE

Users assigned the expert role only see the user currently logged in, and cannot add, edit, or delete a user.

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: |@#~!\$%<>+\_-.,\*?= .

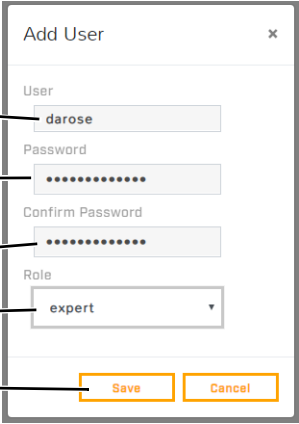
## Configuration

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

| Role                                    | Access                                                                                                                                                                                                                                    |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| user                                    | Can: <ul style="list-style-type: none"><li>• View the live radar display</li><li>• Zoom the live radar display</li><li>• View the Help page</li><li>• Log out</li></ul>                                                                   |
| expert                                  | Cannot manage users: <ul style="list-style-type: none"><li>• Cannot add/edit/delete users</li><li>• Cannot change passwords</li></ul> Can access and use all other View Settings and System Settings pages, menus, controls, and settings |
| admin, including the default admin user | Can access and use all of the radar's web pages, including adding/editing/deleting users (but cannot delete the default admin user), and setting all passwords                                                                            |

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.

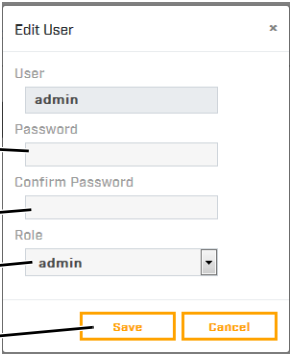
### Add User



Annotations for the Add User dialog:

- Enter user: Points to the User input field containing "darose".
- Enter password: Points to the Password input field.
- Confirm password: Points to the Confirm Password input field.
- Set role: Points to the Role dropdown menu showing "expert".
- Click Save: Points to the Save button.

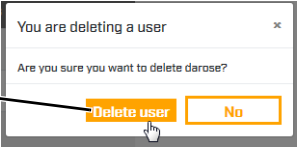
### Edit User



Annotations for the Edit User dialog:

- Enter password: Points to the Password input field.
- Confirm password: Points to the Confirm Password input field.
- Set role: Points to the Role dropdown menu showing "admin".
- Click Save: Points to the Save button.

### Delete User



Annotations for the Delete User dialog:

- Click trash can icon: Points to the trash can icon in the Actions column for the "user" row.
- Click to confirm: Points to the "Delete user" button in the confirmation dialog.

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

[ADD USER](#)

### 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](#)

Changes to the security configuration settings on the Cyber page do not immediately take effect. To apply changes, click **Save** and then reboot the radar.

The screenshot shows the 'CYBER' configuration page with the 'Certificates' section selected. The 'Certification area' is set to 'TLS/HTTPS' and '802.1x'. The 'Self-Signed' radio button is selected. The form includes fields for Country Code, Province Name, City Name, Common Name, Organization Name, Organization Unit Name, Email Address, and Expiration Time (months). A 'CREATE CERTIFICATE' button is at the bottom. Navigation links include 'BACK TO VIEW SETTINGS' and 'DISCARD CHANGES'.

#### 4.4.1 Certificates

Before you can enable TLS/HTTPS, you need to generate or upload a valid certificate. You can:

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

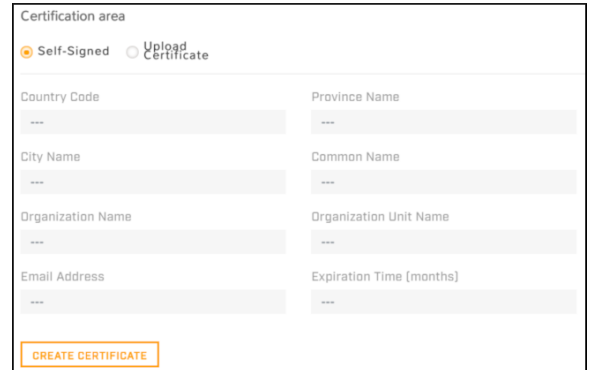
Certificates and keys must be in PEM format. Common file extensions for TLS files in PEM format are:

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

From the Certificates section of the Cyber page, you can download certificates 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.

### To generate and install a self-signed certificate:

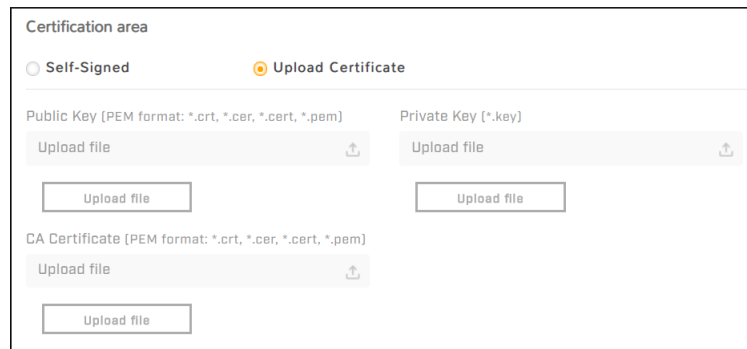
- Step 1 In the Certificates section, under Certification area, select **Self-Signed**.
- Step 1 Enter information such as country code, city name, and organization name.
- Step 2 Click **Create Certificate**.
- Step 3 Allow 15 seconds for the radar to generate the certificate, at which point a confirmation appears.



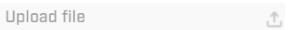
The screenshot shows the 'Certification area' form with the 'Self-Signed' radio button selected. The form contains several input fields: Country Code, Province Name, City Name, Common Name, Organization Name, Organization Unit Name, Email Address, and Expiration Time (months). Each field has a placeholder '\*\*\*'. At the bottom right, there is an orange button labeled 'CREATE CERTIFICATE'.

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

- Step 1 Select **Upload Certificates**.



The screenshot shows the 'Certification area' form with the 'Upload Certificate' radio button selected. The form has three sections for file uploads: 'Public Key (PEM format: \*.crt, \*.cer, \*.cert, \*.pem)' with an 'Upload file' button and an upload icon; 'Private Key (\*.key)' with an 'Upload file' button and an upload icon; and 'CA Certificate (PEM format: \*.crt, \*.cer, \*.cert, \*.pem)' with an 'Upload file' button and an upload icon. Each section also has a secondary 'Upload file' button below the main one.

- Step 2 If you are uploading a self-signed certificate, under **Public Key** and then under **Private Key**:
- Click  .
  - Select the appropriate key file.
  - Click  .
- If you are uploading a third-party CA signed certificate, select and upload the **Public Key**, **Private Key**, and **CA Certificate**.
- Step 3 Verify that the radar certificate files are valid. Make sure *Certificates are OK* appears under the certificate information. Certificate information appears at the bottom of the Certificates section, under Download certificate.

#### 4.4.2 IEEE 802.1X-Compliant Communication

Enable or disable IEEE 802.1X-compliant TLS communication.

## Configuration

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 the EAP configuration page. On the left, there are input fields for '802.1x' and 'EAP method'. The 'EAP method' is set to 'PEAP'. Below this, there are input fields for 'Identity' and 'Private Key Password'. At the bottom, there are buttons for 'BACK TO VIEW SETTINGS', 'DISCARD CHANGES', and 'SAVE'.

Changing these settings does not immediately take effect. To apply a change to these settings, click **Save** and then reboot the radar.

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

The screenshot shows the TLS/HTTPS configuration page. On the left, there are input fields for 'TLS/HTTPS'. At the top, there are toggle switches for 'Control' and 'HTTPS Redirect', both set to 'On'. At the bottom, there are buttons for 'BACK TO VIEW SETTINGS', 'DISCARD CHANGES', and 'SAVE'.

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

Enable or disable HTTPS redirect.

Changes to these settings do not immediately take effect. To apply the changes, click **Save** and then reboot the radar.

### 4.4.4 Other Cybersecurity Services

The screenshot shows the 'Other Cybersecurity Services' configuration page. At the top, there is a 'CYBER' tab. Below it, there are toggle switches for 'FLIR CGI Authentication' and 'Firewall', both set to 'On'. Below these, there is a table with the following services and their 'Allow/Block' status:

| Services        | Allow/Block |
|-----------------|-------------|
| SSH             | Allow Block |
| FTP             | Allow Block |
| RTSP            | Allow Block |
| UPNP            | Allow Block |
| Nexus Discovery | Allow Block |
| Nexus SDK       | Allow Block |
| TRK             | Allow Block |
| ICMP            | Allow Block |

At the bottom, there are buttons for 'BACK TO VIEW SETTINGS', 'DISCARD CHANGES', and 'SAVE'.

## Configuration

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:

- SSH
- FTP
- RTSP
- UPNP
- Nexus Discovery
- Nexus SDK
- TRK
- ICMP

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

#### Caution!

Disabling services and ports can affect product functionality.

Changes to Services settings do not immediately take effect. To apply changes to these settings, click **Save** and then reboot the radar.

## 4.5 Map Page

On the Map page, you can:

- Upload a reference map image upon which the radar overlays its display and calibrate the radar to the map.
- Upload a Digital Elevation Model (DEM).

The screenshot displays the 'MAP' page of a web interface. At the top, a navigation bar includes a 'MAP' tab. The main content area is divided into three sections on the left and a large map display on the right. The 'Map Display' section has a 'Find file' input, an upload icon, and 'UPLOAD' and 'DOWNLOAD' buttons. The 'Calibration' section contains two sets of input fields for 'P1' and 'P2', each with 'X', 'Y', 'Lat', and 'Lon' labels. The 'Digital Elevation Model' section also has a 'Find file' input, an upload icon, and 'UPLOAD' and 'DOWNLOAD' buttons. The large map display on the right is currently black. At the bottom left, there is a '< BACK TO VIEW SETTINGS' link. At the bottom right, there are 'DISCARD CHANGES' and 'SAVE' buttons.

## Configuration

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### To upload a reference map image and calibrate the radar to the map:

- Step 1 Using an online map or GPS service such as Google Maps, download a reference map image.

For example, if you use Google Maps or another online map, you can take a screenshot of a satellite view of the radar's detection range. In Windows 10, you can use the default keyboard shortcut (Windows logo key + Shift + S) to take the screenshot, paste the screenshot into an image editor (for example, Paint), and then save the image in JPG or PNG format. The size of JPG files are optimized better.

#### Tips

When you take the screenshot, make sure that north is straight up in the map image and that the map is flat (2D).

Use a large, high-resolution screen or display in its native resolution with no zoom. You might get better results taking the screenshot with the map source in full screen (in Google Chrome, press F11). Also, in Google Maps, for example, it might help to turn off labels.

Keep in mind where the radar is or will be mounted and oriented and take a screenshot that covers an area a little larger than the radar's range (for the US model, 800 meters).

The quality and resolution of the map image should be high enough so that the reference map is useful when you zoom in on the radar display.

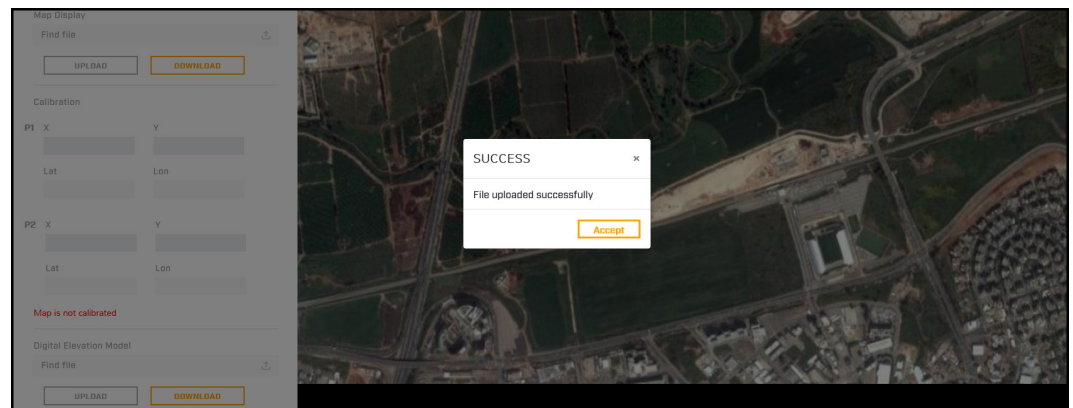
It might take a few attempts at different settings to achieve the best result.

- 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.

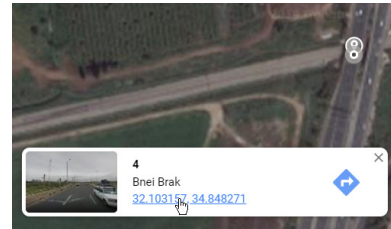
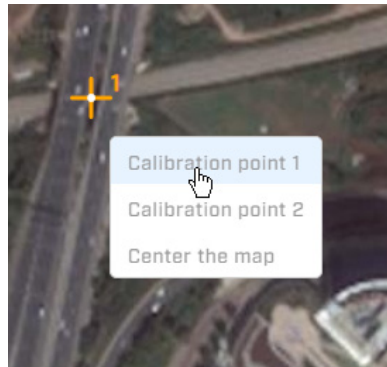
- Step 3 Under Map Display, click **Find file**, and then click **Upload**.

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.



**What's here? in Google Maps**

### **Right-click on map on Map page**

- Step 4 Right-click on the first calibration point, and then select **Calibration point 1**.
- 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 a point and select **What's here?** The point's latitude and longitude coordinates appear. Click the coordinate link, and then copy and paste the coordinates.

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

The calibration points appear in the map as crosshairs icons.

- Step 7 Click **Save**.

The radar calibrates the map. When a map is not calibrated, a message appears onscreen.

To upload a Digital Elevation Model, click **Find file**, click **Upload**, and then click **Save**.

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

## **4.6 Radar Fusion Page**

To provide full radar coverage for a sector, the ranges of two or more Elara Radars might overlap. You can configure an Elara Radar to fuse tracking information from one or more other Elara Radars with its own tracking information.

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

You also need to 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](#).

## Configuration

The screenshot shows the 'RADAR FUSION' configuration page. At the top, there are several tabs, with 'RADAR FUSION' highlighted in orange. Below the tabs, there is an 'Enable' section with two buttons: 'On' (highlighted in orange) and 'Off'. Underneath, there is a 'Radar Sensor' section with an 'Address' input field and an 'Add' button (highlighted in orange). Below this is a table with the following columns: 'Radar Name', 'IP', 'Connected', 'Registered', 'Transmitting', and 'Select'. The table contains one row with the following data: 'R-290 405', '172.20.70.139', '---', '---', '---', and a checkbox. To the right of the table is a 'Refresh' button (highlighted in orange). At the bottom of the page, there are three buttons: '< BACK TO VIEW SETTINGS' (highlighted in orange), 'DISCARD CHANGES', and 'SAVE' (highlighted in orange).

Enable radar fusion, and then select this Elara Radar and one or more other Elara 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.

To save any changes, click **Save**.

### 4.7 Firmware & Info Page

The screenshot shows the 'FIRMWARE & INFO' configuration page. At the top, there are several tabs, with 'FIRMWARE & INFO' highlighted in orange. Below the tabs, there is a 'Firmware Version' section with the text 'v1.0.0.29'. To the right of this is a 'Name' input field with the value 'R-290 405'. Below the 'Firmware Version' section is a 'Make sure the camera has been rebooted recently before the upgrade' message. Underneath is an 'Upgrade version' section with a 'Find file' input field and a 'UPGRADE' button. To the right of this is a 'Serial Number' input field with the value '405'. Below the 'Upgrade version' section is a 'Reset factory default and reboot' section with three buttons: 'FULL RESET', 'PARTIAL RESET', and 'REBOOT'. To the right of this is a 'Model' input field with the value 'R-290'. Below the 'Reset factory default and reboot' section is a 'Support system info' section with a 'DOWNLOAD' button (highlighted in orange). To the right of this is a 'MAC address' input field with the value '00:40:7F:41:F6:AD'. Below the 'Support system info' section is a 'Log Level' section with a dropdown menu set to 'Off'. To the right of this is an 'Up Time' input field with the value '3 day(s) 21:12:47'. At the bottom of the page, there are three buttons: '< BACK TO VIEW SETTINGS' (highlighted in orange), 'DISCARD CHANGES', and 'SAVE' (highlighted in orange).

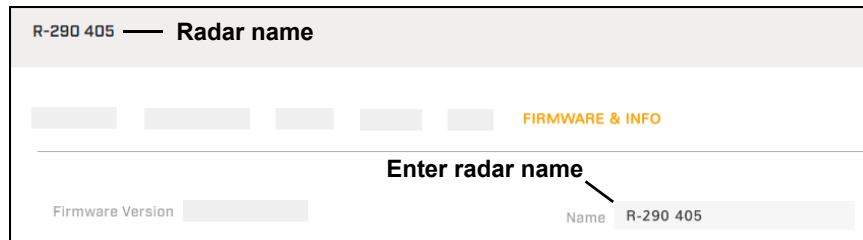
On the Firmware & Info page, you can:

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

## Configuration

### Name

Enter a unique, friendly name for the radar, using only alphanumeric characters. The default name for the radar is the model (R-290) followed by its serial number.

The screenshot shows a web interface for configuring a radar. At the top, there's a header bar with 'R-290 405' and 'Radar name'. Below this is a navigation bar with several tabs, including 'FIRMWARE & INFO' which is highlighted in orange. The main content area has a large text input field labeled 'Enter radar name'. Below this field, there are two smaller input fields: 'Firmware Version' and 'Name'. The 'Name' field contains the text '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 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

Set the logging details up to four log levels; higher log increase the size of the log file.

Click **Download** to retrieve the radar's log files.

# 5 Maintenance and Troubleshooting Tips

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

## 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**.

Authentication is required when logging into the radar stream using any of the user/passwords set up by an administrator (admin level login). Refer to [Users Page](#).

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



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