INSTALLATION GUIDE

Thermal Radar Settings

THERMAL™
RADAR

Visionary Thermal Detection

Thermal Radar™ Web Configuration Page

Open a web browser and type the following URL into the
URL text box (Port 8080)

http://192.168.1.110:8080

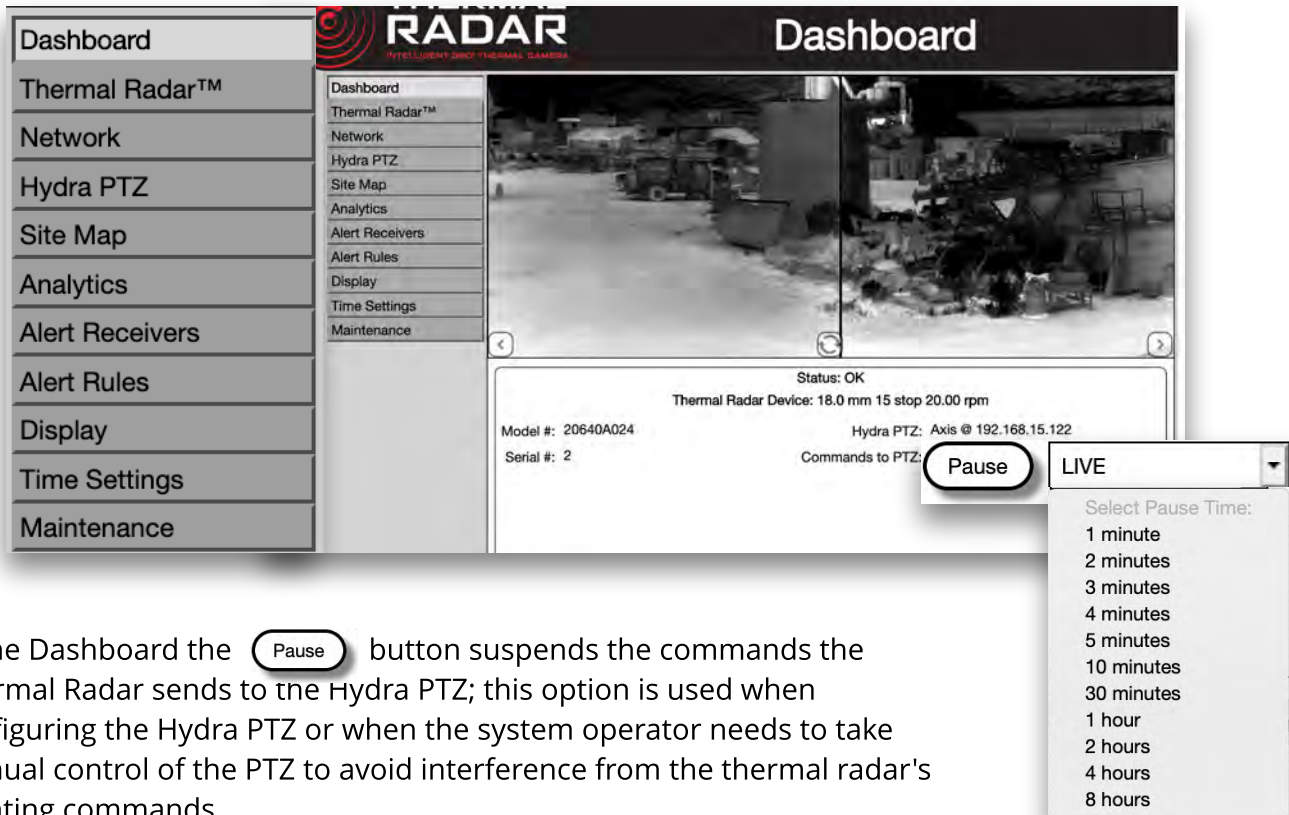⚠️ **Note**: *Internet Explorer is not supported*

Login Screen

The Login screen will likely be the first thing you see when opening the Thermal Radar Web interface. The Default username will be admin, and the default password is Admin1234. (See User management)


Side Menu

The **Side Menu** is used to navigate between the different settings pages within the Thermal Radar interface. Click on any of the tabs to navigate between the settings pages.

Dashboard

In the Dashboard the Pause button suspends the commands the Thermal Radar sends to the Hydra PTZ; this option is used when configuring the Hydra PTZ or when the system operator needs to take manual control of the PTZ to avoid interference from the thermal radar's pointing commands.

The Dropdown next to it will allow the user to select the duration of time that the commands will automatically resume being sent to the PTZ as a safeguard.

The 🔄 will refresh the panoramic view displayed above the Status, Sensor Type, # of stops, and speed as well as the Model # and Serial # of the Sensor.

Thermal Radar Setup

The **Thermal Radar™ Physical Setup** page is used to assign a name to the unit, select the rotation stops, display the resulting coverage based on the number of stations and the HFOV of the sensor within the unit, and to select the Mounting height.

The **Physical Setup** box is used to assign a name and a relative mounting height to the Thermal Radar™.

Use the **Name** text box to assign a unique name to the Thermal Radar™. This will make it easier to identify each Thermal Radar™ when multiple radars are installed on the same network.

Use **Mounting Height** to assign the measured height from the top of the Thermal Radar™ to ground level of the mounting location (measured in *feet* or *meters*).

The Thermal Radar™ utilizes the Mounting Height to calculate the detection range. The range information is used to determine size and type of object, as well as distance, which is used to filter out false detections.

The **Rotation Stops** determines how many times the sensor stops during a revolution and determines the number of stations created in the Panorama.

Coverage displays the gap or overlap between stations in degrees as calculated by the HFOV of the sensor and the number of stops. The necessary number of stops to ensure overlap differs between sensor models. Reducing the number of stops will increase possible rotation speed and frame rate in the final panorama but may result in gaps between stations in which case there will not be complete coverage. If it shows an overlap then neighboring stations may show redundant visual information and detections on the edges of the stations.

Advanced Setup

The **Sensor Tilt Angle** option allows the user to change the angle of the thermal sensor to one of the predefined standard positions, Down (default), Level and Up.

*Note: the **Level** and **Up** positions are rarely used, and should not be selected unless consulting Thermal Radar™ tech support.*
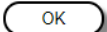
The **Detection Mode** allows the system to be changed from to *Intrusion* or *Fire* detection modes (Detection Mode is not shown on some versions of the Thermal Radar).

Slowing down the rotation rate can help decrease vibration and improve analytics in some settings. Increasing motor speed can help improve consistency of rotation for larger lenses and colder environments.

Advanced Mounting Height Configuration

In the **Advanced Mounting Height Configuration** dialog, the user can set a mounting height and angle for each station. This also allows the user to set different angles from the default angles. The height unit is based on the unit selected in the Physical Setup section.

Negative numbers in tilt angle indicate down tilt.

Click (OK) to save changes to Thermal Radar™.

Note: Adjusting the settings in the Advanced Mounting Height Configuration can cause the Thermal Radar™ to stop detecting if done incorrectly. It is recommended to contact tech support before making any changes.

Thermal Radar Support: ✉ *support@thermalradar* 📞 *+1-385-535-867* 💬 http://thermalradar.com/support/
Support Hours: 9am - 5pm Mountain Standard Time (GMT -7)

Network Configuration

The **Network Configuration** page allows the user to configure network settings for the Thermal Radar itself and the Thermal Radar™ the Thermal Radar is paired with.

Click [Edit Settings] to change the settings of either the Thermal Radar, the Thermal Radar™ or both.

If you wish to return to previous settings click [Undo Edits] for the device you wish to restore.

A message will indicate which devices will restart when [Apply Changes] is clicked.

Note: Changing the Thermal Radar™ IP address will force the Thermal Radar to restart as well to re-establish the connection with the Thermal Radar. (3-6min)

Click [Apply Changes] to apply the IP settings and restart the affected devices.

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Thermal Radar™
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Thermal Radar™ Network Settings

Mode: Static

Thermal Radar™ IP Address: 192.168.1.111

Subnet Mask:

Default Gateway:

Preferred DNS:

[Edit Settings] [Undo Edits]

TRIA Network Settings

Mode: Static

System (TRIA) IP Address: 192.168.1.110

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

Preferred DNS: 192.168.1.1

Host Name: NVT2beta

MAC Address: 94:c6:91:1a:49:55

[Edit Settings] [Undo Edits]

[Apply Changes]

Hydra PTZ Configuration

The **Hydra PTZ Configuration** page allows the user to pair and align a PTZ with the Thermal Radar™ as well as configure the behavior of the PTZ in response to detections.

PTZ Camera Settings

The **PTZ Camera Settings** panel is used to pair/connect the Hydra PTZ to the Thermal Radar/Thermal Radar system.

Use the **PTZ Brand** drop down to select the brand of the PTZ to be controlled.

Note: The PTZ should be mounted on the same vertical axis as the Thermal Radar™

Enter the **IP Address** of the Hydra PTZ,

Enter the **User Name** and **Password** of the PTZ,

If the PTZ was provided by Thermal Radar™, the factory password will be:

User Name: admin

Password: Hydra360

Hydra PTZ Alignment

The **Hydra PTZ Alignment** panel is used to align the PTZ with the Thermal Radar™.

Note: If the PTZ is not aligned with the Thermal Radar™, the PTZ will not be pointed onto target/detections accurately.

The PTZ 0 degree position needs to line up with the Thermal Radar™ home position (left edge of station 0). If the PTZ is installed to line these positions at startup then this step may not be necessary. In many cases, it is difficult to determine the 0 degree position on the PTZ. The Hydra PTZ Alignment makes it easy to adjust for any difference.

Click (Open PTZ in Browser) to open the PTZ feed in a browser. Login to the PTZ and begin viewing the video stream

Click (Test Pan Alignment) to test the Pan Offset Alignment.

Adjust Pan Offset Alignment to adjust the PTZ Pan 0 position. Increase the numbers of degrees to adjust clockwise and decrease number of degrees to adjust counter clockwise.

Click (Test Pan Alignment) to see the updated location. Adjust the Pan Offset Alignment until the Pan 0 view matches the Station 0 view of the Thermal Radar. You can check the Site Map page to see an image from Station 0 on the Thermal Radar™.
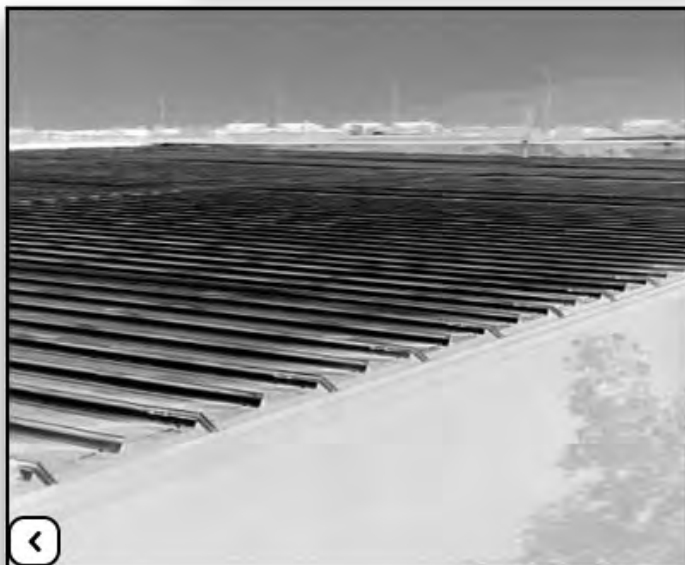

Thermal Image of Station 0

PTZ view lined up with station 0

Tilt and Zoom Adjustment

Tilt and Zoom Adjustment panel is used to fine tune and improve the PTZ's accuracy of pointing on target when the Thermal Radar™ senses a detection.

Tilt Adjustment adjusts the PTZ's tilt (up and down) when it is pointed on target. Positive numbers will adjust the PTZ upward and Negitive numbers will adjust the PTZ downward.

Reach Max Zoom at adjusts the distance in which the PTZ will reach its maximum zoom level.

Maximum Zoom Level adjusts the PTZ's maximum zoom level.

Example: with the Reach Max Zoom setting set to 200 meters, and the Maximum Zoom Level bar is set halfway, the PTZ's max zoom will be 50%. In this circumstance, if there is a detection at or beyond 200 meters, the PTZ will only zoom to 50%. If there is a detection at 100 meters, the PTZ will only zoom to 25%.

Zoom PTZ during adjustments: When Zoom PTZ during adjustments is checked, the PTZ zooms to 60% of the calculated zoom for the objects distance on the first PTZ movement command. If the object size and distance is consistent with subsequent detections the zoom is increased to the calculated zoom. This is helpful if you have a Tight maximum zoom level as it will avoid zooming past an object the Thermal Radar only partially detected.

PTZ Movement Rules

The **PTZ Movement Rules** dialog is used to determine how sensitive the PTZ is to moving to detections. Leaving the values set to default, the PTZ will be the most sensitive to moving to detections. Increasing the values will make the PTZ less sensitive to detections.

Move After ____ Consecutive Detections: determines how many detections need to occur within a single Area of Interest (AOI) before the PTZ moves on target. The default value is 1.

After Move, Disarm AOI for ___ Rotations: shunts the commands sent to the PTZ to move on target, for each individual AOI, for the programmed number of rotations. This option is turned off by default and the value is set to 0.

Note: the amount of time it takes to complete a full rotation varies between Thermal Radar™ models.

Site Map Configuration

The Thermal Radar displays the site map as part of the video stream. Dots are displayed on the site map to indicate the location of alerts. To ensure the site map displays and shows the locations of the alerts correctly, a satellite image of the area needs to be uploaded and the Thermal Radar's North face needs to be configured.

Update/Upload Site Map

To upload a map to the Thermal Radar, the user can type in a GPS coordinate or navigate the uploaded satellite map with a mouse to locate the position of the Thermal Radar™. Selecting Update Map   will update the coordinates will update the map and moving the map will update the coordinates. Then select Apply Changes   to save changes.

To load a previously saved image, select Load Image...   and browse to the image file to be uploaded.
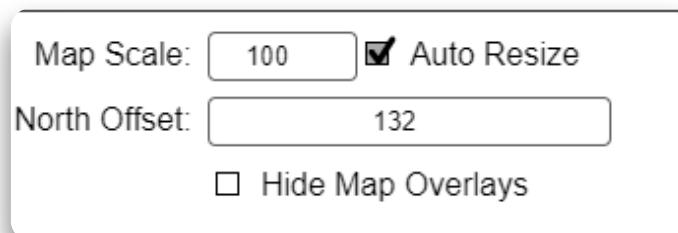
Map Scale

The **Map Scale** setting is used to calculate position of detections on the site map (it does not affect the Thermal Radar's detection distances). Map Scale updates based on the map scale as user zooms in and out of the map, or the user can use the *Map Scale* text box to scale the satellite image (in and out) if *Auto Resize* is checked.

Scale = center of map (red dot) to the edge of the green circle.

Increasing the Map Scale value will move the dots that appear on the map, in the Thermal Radar video stream, closer to the Thermal Radar™.

Decreasing the Map Scale value will move the dots that appear on the map, in the Thermal Radar video stream, further from the Thermal Radar™.

Note: If the Thermal Radar is installed on uneven ground, then the map dots may display incorrectly because the distance model is based off of flat terrain.

North Offset

North Offset indicates the number of degrees, clockwise, North is from the center of station 0 on the Thermal Radar™.

To set North on the Thermal Radar™, identify an object that is North in the Thermal Radar's view and adjust North Offset until the N-line lines up with said object. The station view has arrow buttons (< >) to move from station to station, and an indicator arrows (◀ ▶) indicate as to which direction the N-line can be found.

Increasing **North Offset** value will move the dots on the map counter-clockwise, and *decreasing* the **North Offset** value will move the dots clockwise on the map.

By checking ☑**Hide Map Overlays**, the green circle on the map and the red North Offset indicator will be removed from the displays

Analytics Configuration

Thermal Radar 2.0 supports configuring **Areas of Interest (AOI)** for the Thermal Radar™. AOI's are used to indicate areas where alerts are to be detected and indicate which types of alerts to detect. Users can add any number of AOI's. It is recommended that AOI's be large enough to detect an intruder multiple times before the intruder crosses the entire AOI. This will provide for the most control on setting alarm rules.

Each AOI is given an *ID* which can be used in the Alert Rules to determine which alerts to send to designated Alert Receivers.

Use the ⟨ and ⟩ buttons to scroll between stations. Two stations are displayed at a time.

Note: The thermal image is a snapshot, so video is not constantly streaming to the setup application. If an updated image is needed, press Ctrl+R to refresh and update the browser page or use the refresh button .
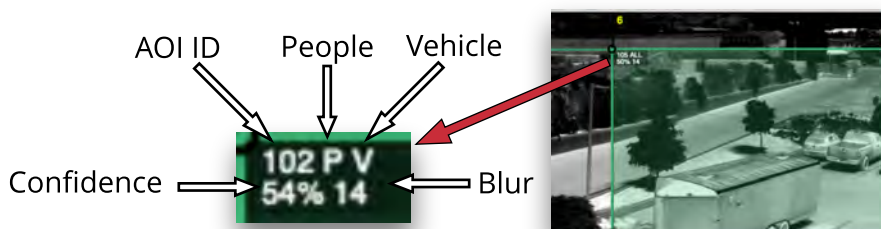

Adding/Deleting AOI's

To add an individual **AOI**, navigate to the station(s) where you wish to place an AOI and click Add AOI to ready the Thermal Radar to receive a new AOI. Click on the area where the AOI will start and drag to the stop point. Each new AOI has round handles ● on the corners that can be used to adjust and move the AOI once created.

To **Delete** a *Mask* or *AOI,* select the object and click Delete

Adjusting AOI's

The **Area of interest** will show it's ID on the settings panel and in the upper left corner of the AOI. It will also show the *Confidence*, *Sensitivity*, *Blur* and which filters (*People* and/or *Vehicles*) are applied to the AOI. You can adjust these settings in the **Settings Panel**.

Select **Filters** for *Person*, *Vehicle* or select both. Selecting neither will disable the classification filter and allow all detected movement to trigger alarms.

Sensitivity indicates how sensitive the area should be to changes in intensity. Objects closer to the thermal radar can be detected in AOIs of lower sensitivity, typically between 12 and 15. Objects further out can be detected with AOIs with higher sensitivity, 15-17 without generating a lot of false detections.

Confidence is used if *Person*, *Vehicle* or both are selected. It determines how closely an object needs to match the classification characteristics to be a valid detection. This can be used to filter out small animals and some random movement.

In Thermal Radar 2.0, AOIs can now include a **Blur** value. By default, there is no blur, this gives the best performance for detecting movement. The blur is useful for filtering out small movement which can be generated by wind on grass or bushes, or fabrics.

If desired, check the ☑ **Copy Settings From Last AOI** box to copy the settings from the last AOI, to the next AOI created.

Mask/Exclusions

Thermal Radar 2.0 changes Exclusion areas to **Masks**. These work similar to Exclusions in previous versions where the user can click on (Add Mask) then mouse click and the area where the mask will start and drag the cursor around the outline of the area to mask. you can click on the ⬤ handles to to reshape the mask after the area has been traced. The default Mask setting is to exclude any portion of the Mask inside an AOI from detecting. Masks also have a **Blur** value which can be adjusted to change the Mask from an Exclusion to a Blur Mask to blur only a portion of an AOI.

Quick Setup

Quick Setup will allow the user to send out a *Single layer* or *Multi-layer* pattern of AOIs with the selected values to the selected stations. Each selection covers each selected station from bottom to the horizon with AOIs.

Single Layer populates a single AOI per station

Multi Layer populates multiple layers of AOI's per station

Click All to select all stations, or remove all stations if they are all selected.

Note: If you send a quick setup with no stations selected it will erase/delete all of the AOI's from the configuration.

Single Layer

Multi Layer

Alert Receivers

Thermal Radar 2.0 can send formatted alerts to several different VMS's and devices.
The Alert Receivers page is used to configure the communication of the Alerts to the VMS's or devices.

Adding Alert Receivers

To **Add** a new receiver click the (Add) button,

To **Remove** a receiver, select the receiver and click the (Remove) button.

Click (Activate) to **Activate** or select (Inactivate) to **Inactivate** a selected receiver.

The settings for the selected receiver will be displayed in the **Settings** panel. *IP Address*, *Port*, *User Name* and *Password* are the most common settings. Other settings may be required by the receiver such as *URI*, *Signal Delay* (for on/off signals) etc.

Click (Apply Changes) to save receivers. Each receiver can be configured for receiving alarms on the Alert Rules page.

Note: This does not require a restart.

It is possible to create the same receiver type multiple times. Give each a unique name to distinguish them later.

Detection to Alert Rules

Each **Alert Receiver** that is added to the Thermal Radar will be sent alerts based on the Alert Rules at the bottom of the Alert Receivers page.

Alert After ___ Consecutive Detections . . . is how many consecutive detections in a single AOI before sending the alert.

☑ **After Alert, Disarm AOI for ___ Rotations** . . . if checked, it disarms/shunts the AOI for a selected number of rotations before arming the AOI again. While the AOI is disarmed/shunted, it will not send alerts. If not checked, the AOI's are armed and active and will follow the *Alert After ___ Consecutive Detections* rule.

Both of these rules is applied to each AOI in the Analytics page.

Alert Rules

The Alert Rules page is used to configure how alerts will be filtered and sent to each target Alert Receiver added.

Adding Alert Rules

Use **Alert Format** to select the alert receiver the *Alert* will be sent to.

Click (Add) to add a new rule,

Click up ⊕ and down ⊕ arrows to change rule order/priority.

Rules will execute in order and execution will stop when the first rule conditions are met.

Click (Test) to trigger a rule to test if the Receiver's configuration is working.

The settings for the selected rule will show up in the **Rule Settings** panel. Each detection rule has an *Any* option to trigger regardless of detection information.

Detection Type allows the user to filter rules by *Person*, *Vehicle* or Both.

Station allows rules to be filtered by Station.

Confidence allows rules to be sorted by confidence

AOI ID allows rules to be sorted by AOI.

The parameter passed to the Receiver is determined by the receiver type. It will need to match up to a rule or trigger configured in the receiver. For example, the Adam unit has 0-16 digital switches. The Switch ID indicates which switch to trip. The Signal Delay indicates the amount of time, in milliseconds, to trigger the switch before sending an off message.

Select a rule from the list and click (Remove) to remove an existing rule.

Rule Settings

Detection Type:	Any ▾
Station:	Any ▾
Confidence:	Any ▾
AOI ID:	134
Event Message:	EastEntrance

System Event Triggers

Certain **System Events** can also be configured to trigger events in the Receiver.

Check ☑ **Active** next to each System Event and type in the parameter to send.

TR Keep Alive Fail sends a trigger if the Thermal Radars heartbeat call to the Thermal Radar™ fails.

TR Stream Stopped triggers if the Thermal Radar™ stops streaming data to the Thermal Radar.

TR Stream Restarted triggers when the Thermal Radar™ resumes streaming data to the Thermal Radar.

Click (Apply Changes) to save settings.

Note: The Thermal Radar does not require a restart after applying the changes.

System Event	Active	Switch ID
TR Keep Alive Fail	☐	0
TR Stream Stopped	☐	0
TR Stream Restarted	☐	0

Display

The **Display Configuration** page allows format changes to be made to the Thermal Radar's video stream that is sent to the desired Video Management System (VMS).

Video Display

When the Thermal Radar™ identifies a detection, the detection will be highlighted red and the station that contains the detection within the Thermal Radar's video display will illuminate with a yellow border. If any of the Areas of Interest (AOI) within the station are setup to send alerts, the border around the station will illuminate red.
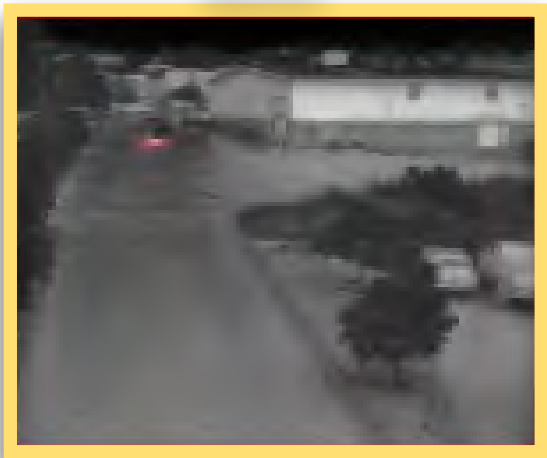

Highlighted Detection

Detection

Alert

Display Settings

Highlight Alert Duration affects how long a station will be highlighted (in RED) when a station sends an alert.

Highlight Detection Duration affects how long a station will be highlighted (in YELLOW) when a station detects motion.

Upper Panorama Starts at Station can be used to change layout of top and bottom station images to start with the requested station in the upper left corner.

Text Size affects the font size used in text displayed in the video stream.

Radar Blip Fade Time affects how many seconds detections (dots) show up on the site map before they completely fade.

Detection Fade Time affects the amount of time a detection takes to fade after the Detection Duration time runs out.

Show Time Stamp shows the Thermal Radar's time in the upper left hand corner of the detection window.

Show Thermal Imaging Radar Logo shows the TIR logo as part of the video stream.

Show Stations IDs labels each station in the video stream starting with 0 as the home station.

Show Areas of Interest allows areas of interest and masks to be broadcast as part of the video stream.

Touring Mode

Touring Mode sets up the Thermal Radar video stream to rotate through each station in the focus window (center of the video display/stream) for the Touring Station Delay time if there is no other activity.

☑ Check the box to **Enable Touring Mode**.

The **Touring Station Delay** time to decides how long each station dwells on the display before it switches to the next station.

Touring Stations can be set to indicate which stations to include in the rotation.
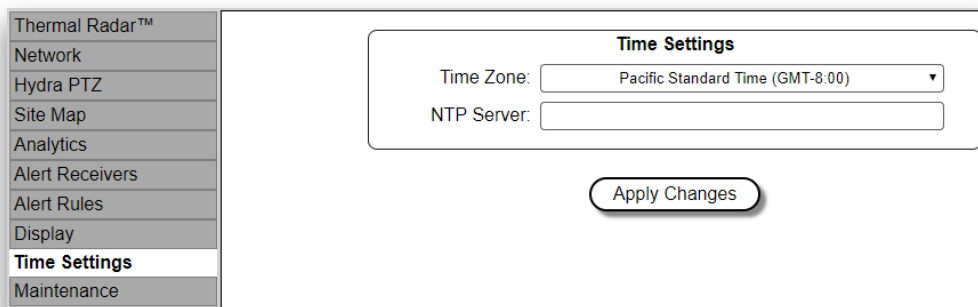

Click (Apply Changes) to save and apply changes to the Thermal Radar's video stream.

Note: No restart is required to make the changes to the video stream

Time Settings

Time Settings allows a *Time Zone* and an *NTP Server* to be assigned to the Thermal Radar.
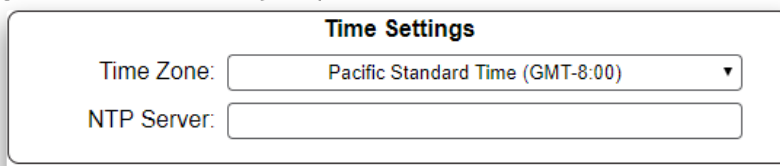

Setting the Thermal Radar's Time

Select the **Time Zone** from the drop down menu that matches the location the Thermal Radar™ is installed.

If desired, enter an IP address of a valid **NTP Server**
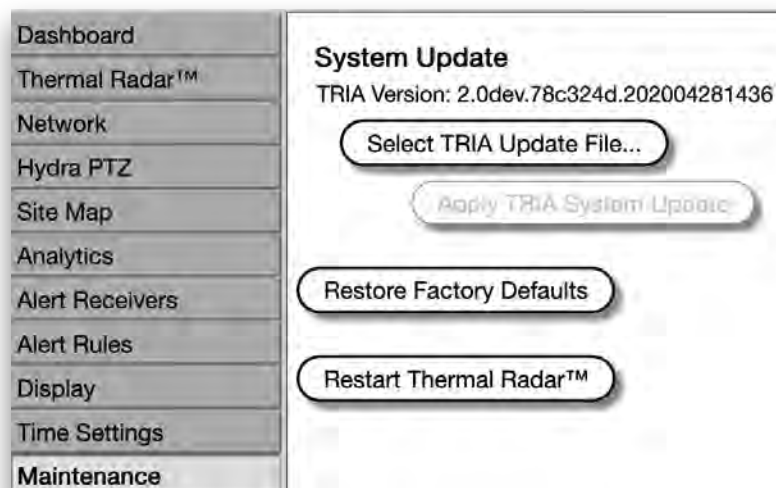
Click ⬭Apply Changes⬮ to save settings.

Note: changing the NTP Server may require the Thermal Radar to be restarted.

Maintenance

The **Maintenance** page is used to update the Thermal Radar™ firmware, restore the unit to it's factory default settings, or restart the Thermal Radar™. The current firmware version of the Thermal Radar and the Thermal Radar™ is displayed where the upgrade files are selected and

Updating Firmware
Thermal Radar Update

Click the ⬭Select TR Update File...⬮ button and browse to the update loaded.

Click the ⬭Apply TR System Update⬮ button to apply the update and restart Thermal Radar™.

Click the ⬭Restart Thermal Radar™⬮ button to restart the unit.

Click the ⬭Restore Factory Defaults⬮ button to restore the unit to the factory settings. Bear in mind that the unit will lose all configured settings.

Step 17: User Management

1. Select **User Management** from the Side bar.
2. Type in User Name and select User Access level from the drop down in the aforementioned fields.
3. Type in and verify Password selected for the User in the appropriate fields conforming to the standards in the dialogue box below the "Add New User" field.
4. Select ⬭ to add the User's profile to the system.

Alert Rules
Display
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✓ User (Configuration Restricted)
Monitor (Dashboard Only)
Administrator (Full Access)

User Management

Add New User

User Name: [＿＿＿＿＿＿]
User Access: [User (Configuration Restricted) ▾]
Password: [＿＿＿＿＿＿]
Verify Password: [＿＿＿＿＿＿]

Existing Users

User Name	Access Level

* Passwords *and* User names are case sensitive *

User Name Validation:
X   Must be 1-20 characters long
ok   May contain Letters, numbers, _ and - only
ok   Must be unique

Password Validation: (☐ Enforce Strict Password Rules)
X   Must be 8-20 characters long
ok   May not contain whitespace or any of: / \ = + : ; " '
—   Must include a lowercase letter
—   Must include a capital (uppercase) letter
—   Must include a number
—   Must include a valid symbol
—   May not include the username (case insensitive)

X   Entered passwords must match