



TETRYON™ CLOUD SERVER

Cloud-Based Software Server User Guide

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1.0 INTRODUCTION TO TETRYON CLOUD SERVER

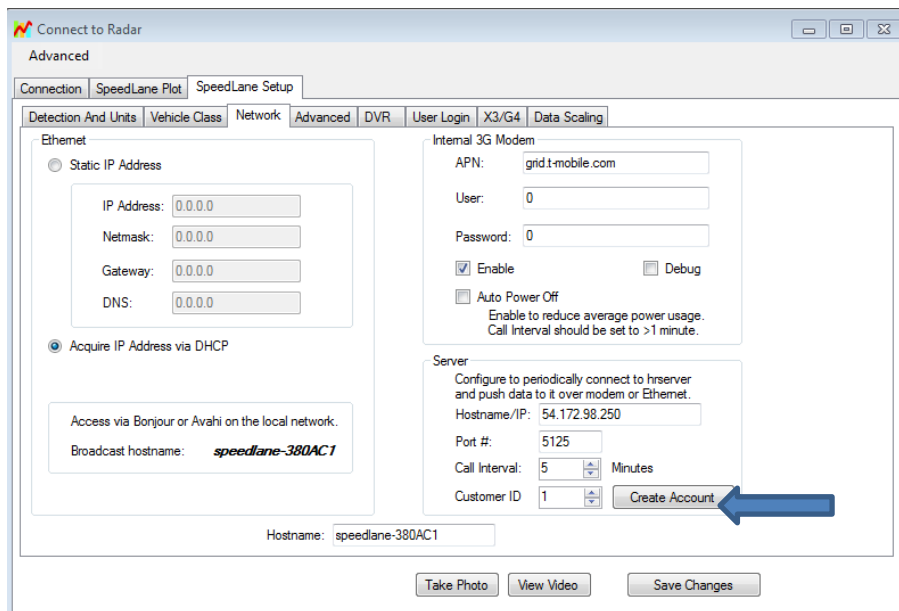
Houston Radar's Tetryon™ Cloud Server is a customizable cloud server software used to automatically aggregate data from multiple [SpeedLane® Pro's](#) and [Armadillo Tracker's](#) in one central location with the data and reports viewable via the Internet browser.

Tetryon is designed to seamlessly interface with our SpeedLane® Pro side-fire radars and Armadillo® Trackers to allow customers to bring their real-time traffic data to the cloud. It is installed on a Linux Ubuntu server that is accessible to radars in the field. The radars periodically call in to the server and Tetryon syncs only newly acquired data from each radar into preconfigured locations assigned to them. Authorized users access the server via a standard Internet browser and can view real time charts or generate historical reports.

An intuitive dashboard view allows the monitoring of average speeds of multiple locations with quick drill-down into detailed and interactive Charts. Advanced Alerts may be configured with simple logic of different parameters. Allowing simultaneous multi-user access through its browser-based user interface, this intuitive product simplifies data analysis and visualization.

You may [request a demo account](#) on our server. A one-time option cost per device is required to be purchased. An annual (or longer term) hosting fee is required per device to maintain access to Tetryon.

Already have a SpeedLane Pro? Request your demo account via the SpeedLane Setup> Network configuration tab.



The screenshot shows the 'Connect to Radar' configuration window. The 'Advanced' tab is selected, and the 'SpeedLane Setup' sub-tab is active. Within 'SpeedLane Setup', the 'Network' sub-tab is selected. The 'Ethernet' section has 'Acquire IP Address via DHCP' selected. The 'Internal 3G Modem' section has 'APN: grid.t-mobile.com', 'User: 0', and 'Password: 0'. The 'Server' section is highlighted with a blue arrow pointing to the 'Create Account' button. The 'Server' section includes fields for 'Hostname/IP: 54.172.98.250', 'Port #: 5125', 'Call Interval: 5 Minutes', and 'Customer ID: 1'. The 'Create Account' button is located to the right of the 'Customer ID' field. At the bottom of the window, there are buttons for 'Take Photo', 'View Video', and 'Save Changes'.

(Config tool 8.0.0030 or later and firmware version 1.2.3 or later required. Ask for a free upgrade if you have an older version)

1.1 Hardware Requirements

At this time, Houston Radar's SpeedLane Pro and Armadillo Tracker devices are compatible with Tetryon. Our OEM radars and Armadillo Crossfire device are not compatible with the Tetryon.

Network connectivity option is required to connect to the server. This can be via one of many options. The SpeedLane Pro must have an internal cell phone modem, an external cell phone modem connected via Ethernet

to the radar, or an Ethernet connection to a switch connected to the network via which it can connect to the server. All SpeedLane Pro radars include a built-in 30-day Tetryon trial period. The SpeedLane Pro requires a Tetryon Activation Key for operation past 30 days. Please contact your local Houston Radar distributor or sales partner, or Houston Radar at sales@houston-radar.com, for more information on the Tetryon trial period or Tetryon Activation Key.

The Armadillo Tracker requires an internal cell phone modem with an active SIM card with a data plan. This may be provided by the customer or purchased from Houston Radar.

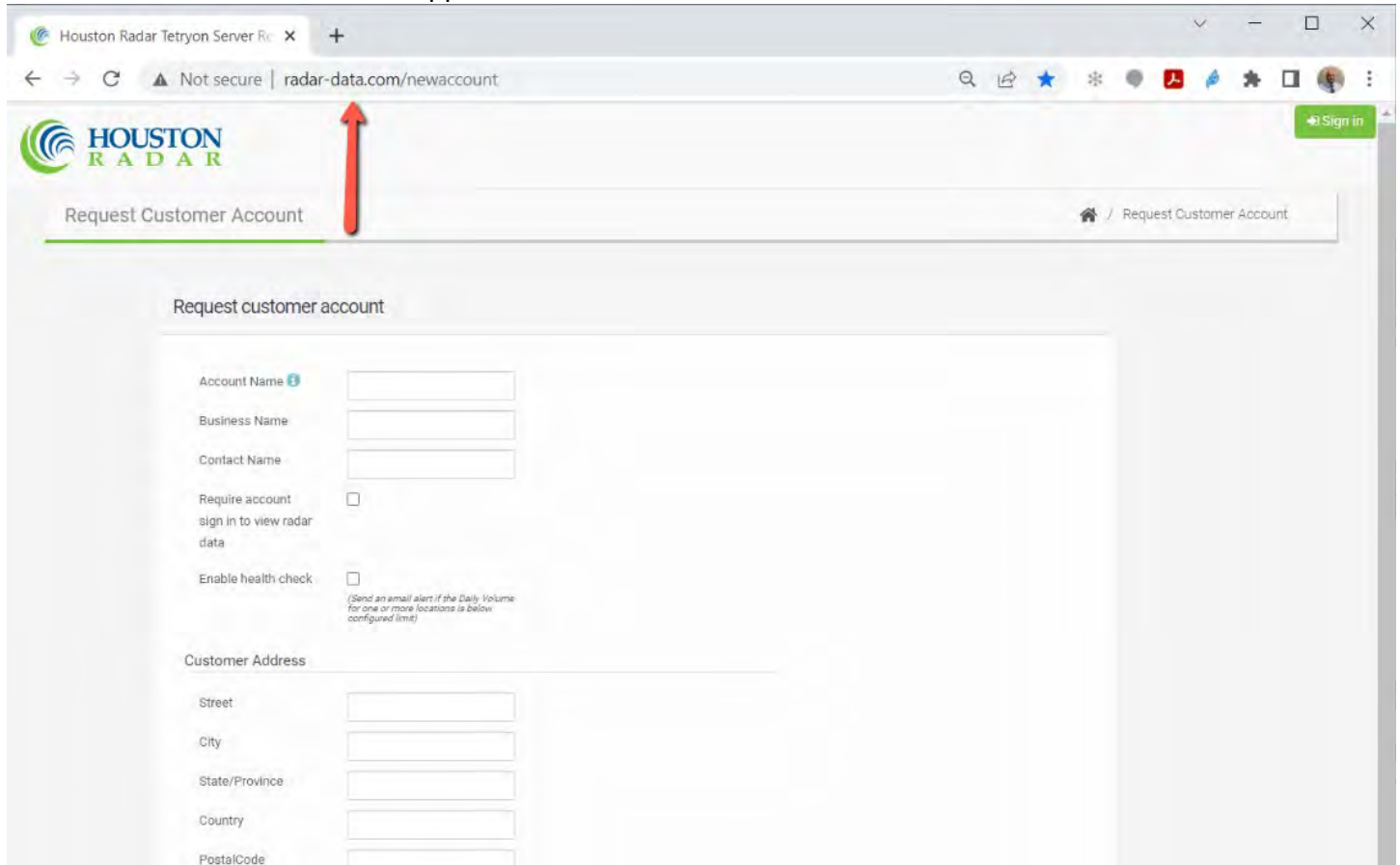
Modem SIM cards must be active on a GSM-backed network (such as AT&T or T-Mobile in the US), and can use either a Static or Dynamic IP address. We support cellular providers outside the US as well.

1.2 Software Requirements

Tetryon's browser-based interface is designed to work with Google Chrome. The interface is also compatible with current versions of Apple Safari, Microsoft Edge, and Mozilla Firefox; compatibility with these, and other, browsers is subject to change without notice.

2.0 CREATING A TETRYON SERVER SOFTWARE ACCOUNT

1. Go to <http://www.radar-data.com/newaccount> to create an admin account login. This will send an email to our sales team who will need to approve the account.



Houston Radar Tetryon Server Re x +

Not secure | radar-data.com/newaccount

HOUSTON RADAR

Request Customer Account

Sign in

Request Customer Account

Request customer account

Account Name

Business Name

Contact Name

Require account sign in to view radar data

Enable health check
(Send an email alert if the Daily Volume for one or more locations is below configured limit)

Customer Address

Street

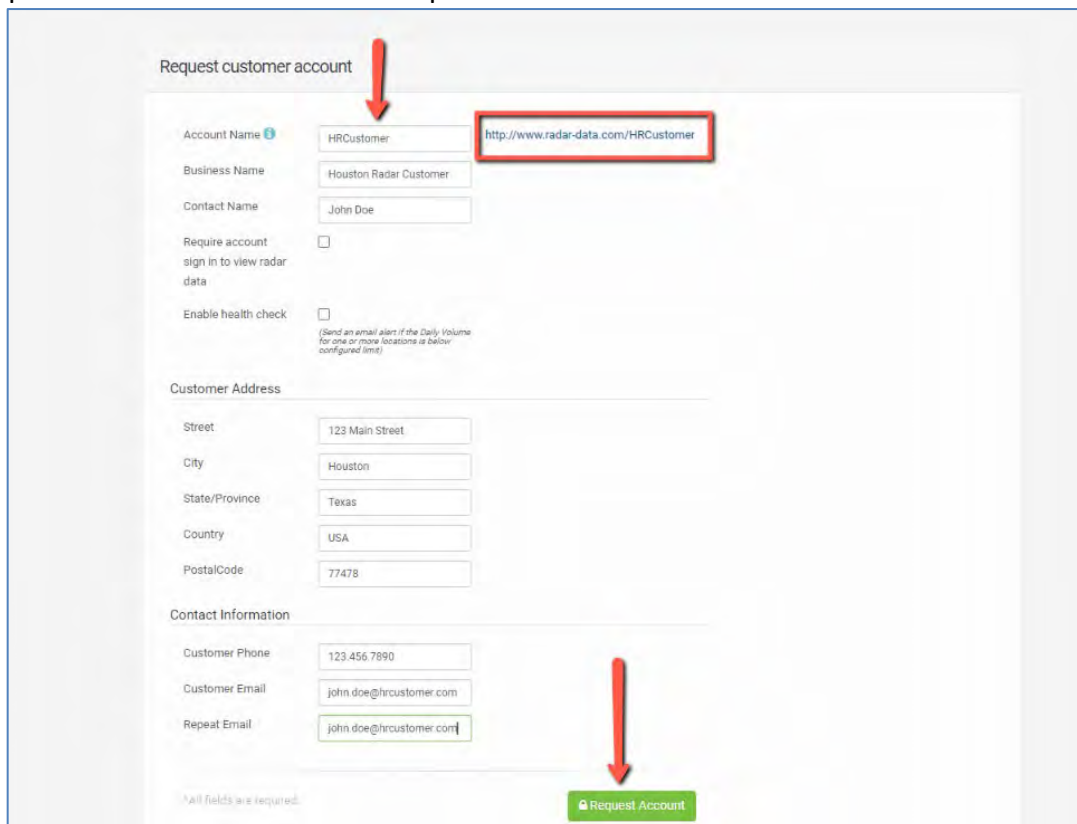
City

State/Province

Country

PostalCode

2. Enter the required information and click “Request Account”



Request customer account

Account Name <http://www.radar-data.com/HRCustomer>

Business Name

Contact Name

Require account sign in to view radar data

Enable health check
(Send an email alert if the Daily Volume for one or more locations is below configured limit)

Customer Address

Street

City

State/Province

Country

PostalCode

Contact Information

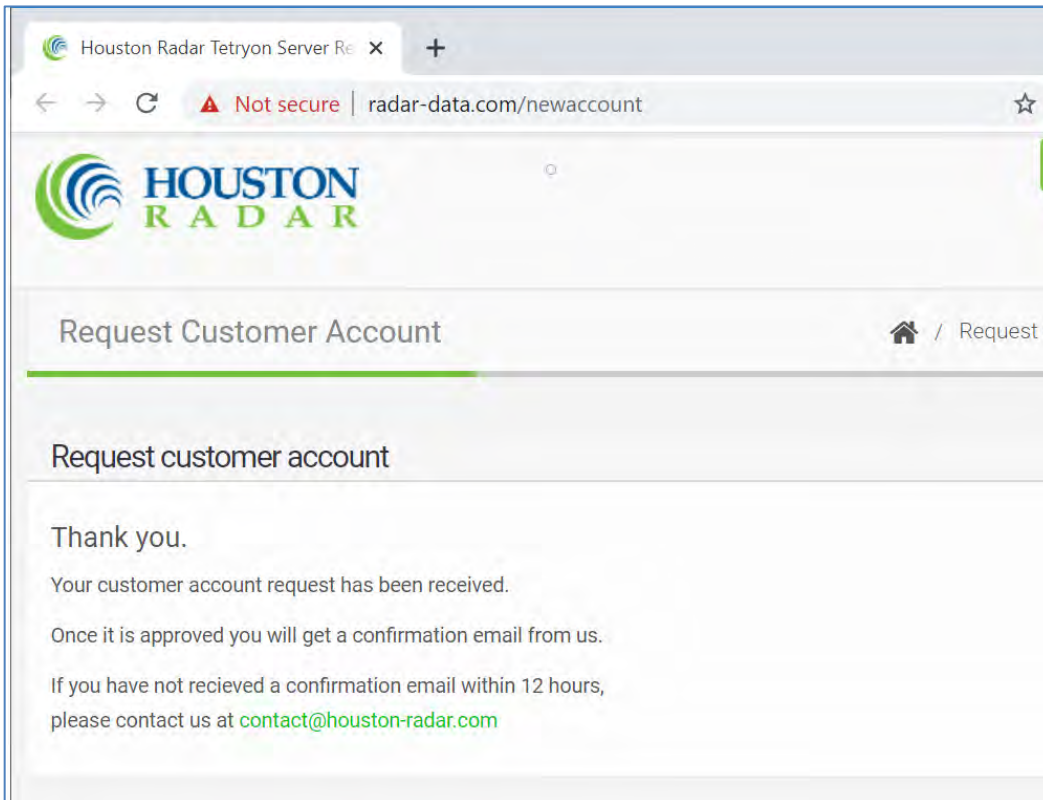
Customer Phone

Customer Email

Repeat Email

*All fields are required.

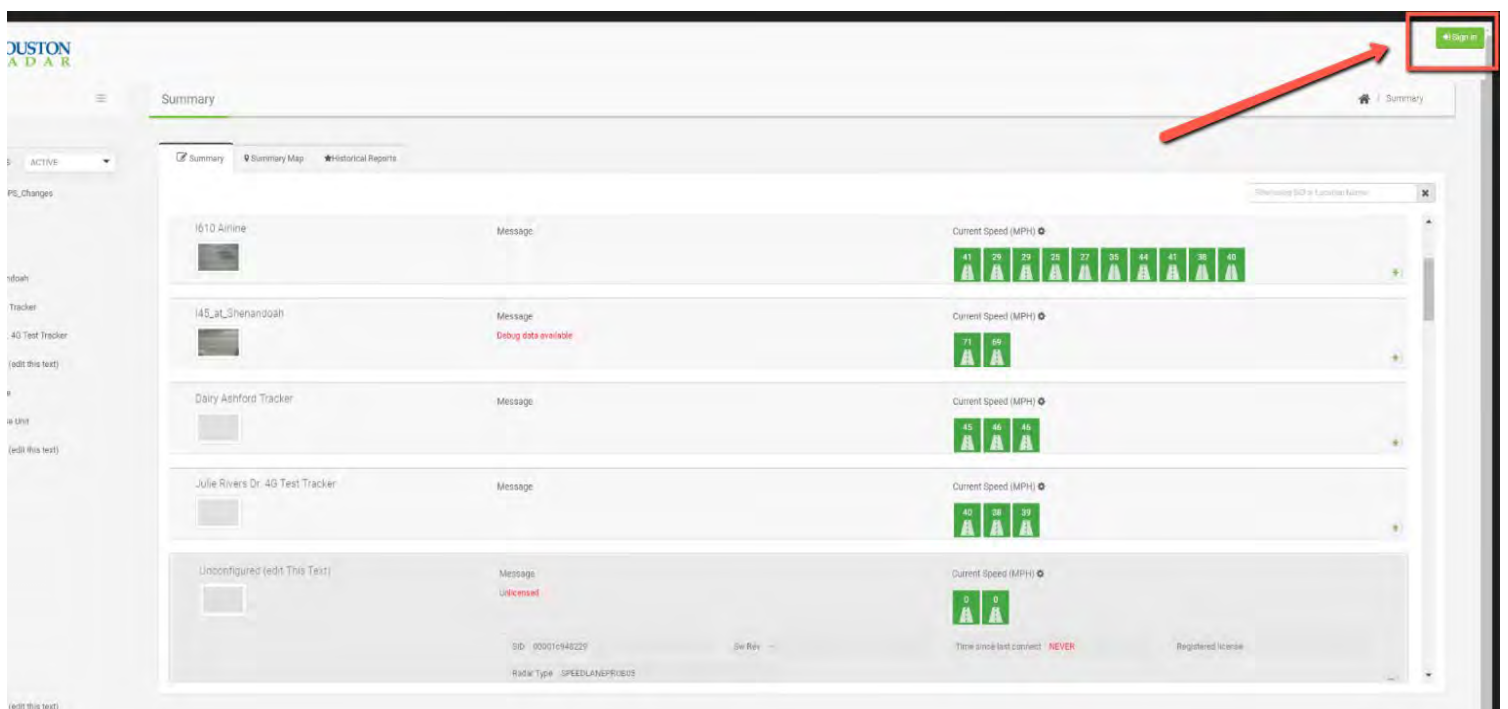
Request Account



3. Houston Radar will approve the request and generate an approval email containing your **Customer ID number**. This ID number needs to be programmed into all radars calling into your account in Tetryon and used to keep different customers' data segregated from each other.

4. Go to [http://www.radar-data.com/\[customerSFN\]](http://www.radar-data.com/[customerSFN]) (inserting the Customer SFN from the Activated customer account email after the last forward slash)

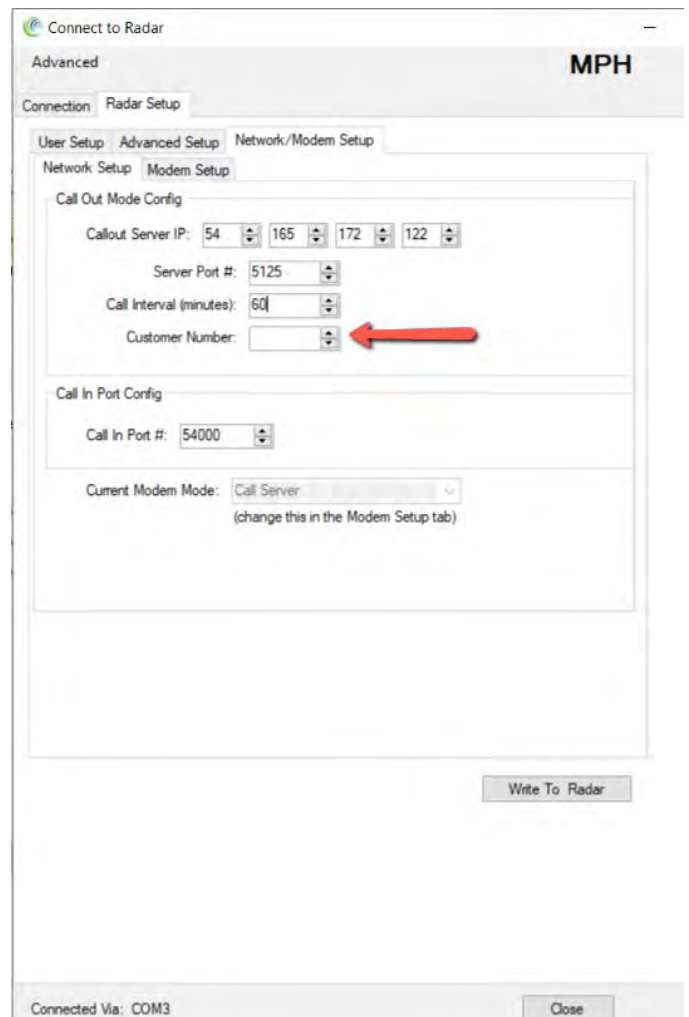
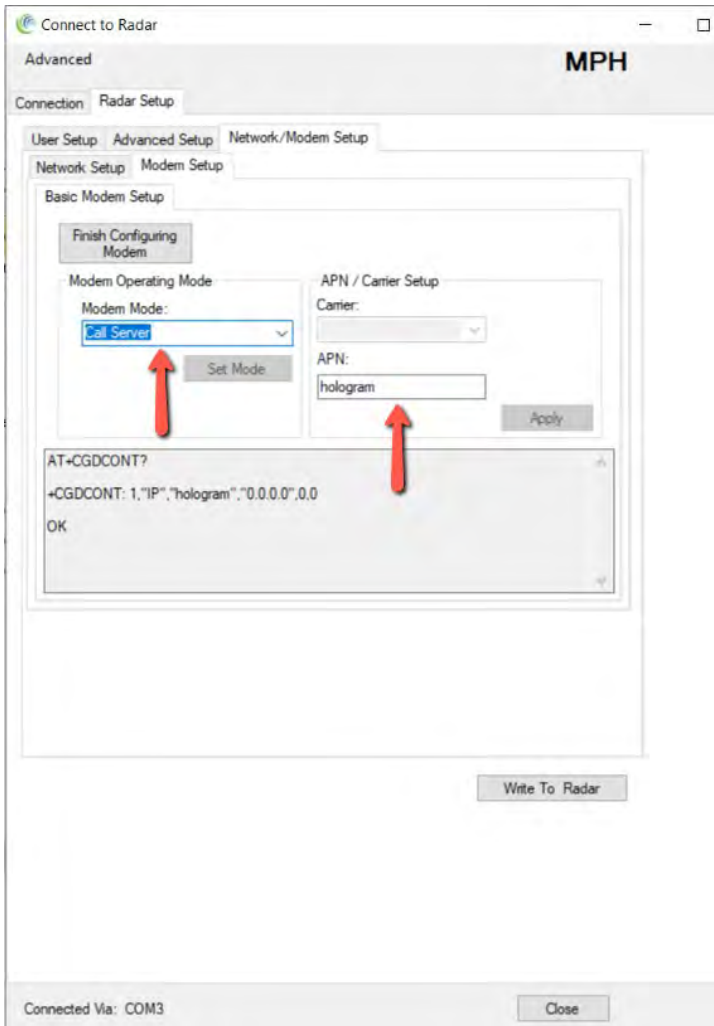
5. Click "Sign In" in the top right corner and use the credentials from step #2 above.



3.0 CONFIGURE AN ARMADILLO TRACKER FOR TETRYON

The Customer ID number must be programmed into the configuration of each Armadillo Tracker via the Houston Radar StatsAnalyzer configuration software. This allows Tetryon to determine which account the calling radar belongs to. The modem also needs to be set up to call out to the Tetryon server. Follow the steps below:

- Connect to desired radar and navigate to “Radar Setup” tab
- Navigate to “Network/Modem Setup” tab within the Radar Setup window
- Navigate to “Network Setup” tab within the Network/Modem Setup window
 - Callout Server IP: **54.165.172.122**
 - Server Port#: **5125**
 - Call Interval (minutes): *user defined frequency of polling; for minimal battery usage, we recommend you set this to at least 30 minutes and preferably to 240 minutes (4 hours). The radar will keep the modem off between connections preserving run time.*
 - Customer Number: *enter the Customer ID number from your approval email*
- Click on “Write to Radar”.
- You will be asked to reboot the device. Click “Yes” to complete the Customer Number assignment



4.0 CONFIGURE A SPEEDLANE PRO FOR TETRYON

The Customer ID number must be programmed into the configuration of each SpeedLane Pro via the Houston Radar StatsAnalyzer configuration software. The modem also needs to be configured to call the server. Follow the steps below:

- Connect to desired radar via serial, Ethernet or Bluetooth, and navigate to "SpeedLane Setup" tab, section "Server" in the bottom right.
- Navigate to "Network" tab within the SpeedLane Setup window
 - Hostname/IP: www.radar-data.com (if DHCP is configured and available, hostname is recommended, else use the IP address 54.165.172.122)
 - Port#: 5125
 - Call Interval (frequency of polling): *user defined*
 - Customer ID: *enter the Customer ID number from your approval email*
- Click on "Save Changes".
- You will be asked to reboot the device. Click "Yes" to complete the Customer ID assignment

Connect to Radar

Advanced

Connection SpeedLane Plot SpeedLane Setup Installation Wizard

Detection And Units Vehicle Bins Serial Port Network Advanced DVR User Login X3/G4 Diagnostics

Ethernet

Static IP Address

IP Address: 192.168.13.113

Netmask: 255.255.255.0

Gateway: 192.168.13.31

DNS: 8.8.8.8

Acquire IP Address via DHCP

Access via Bonjour or Avahi on the local network.

Broadcast hostname: *speedlane-00104E*

Hostname: speedlane-00104E

Internal 3G Modem

APN: []

User: []

Password: []

Enable Debug

Auto Power Off

Enable to reduce average power usage.
Call Interval should be set to >1 minute.

Server

Configure to periodically connect to hserver and push data to it over modem or Ethernet.

Hostname/IP: www.radar-data.com

Port #: 5125

Call Interval: 5 Minutes

Customer ID: []

Server Connection Watchdog

Restart radar if unable to connect server for (hours): 0

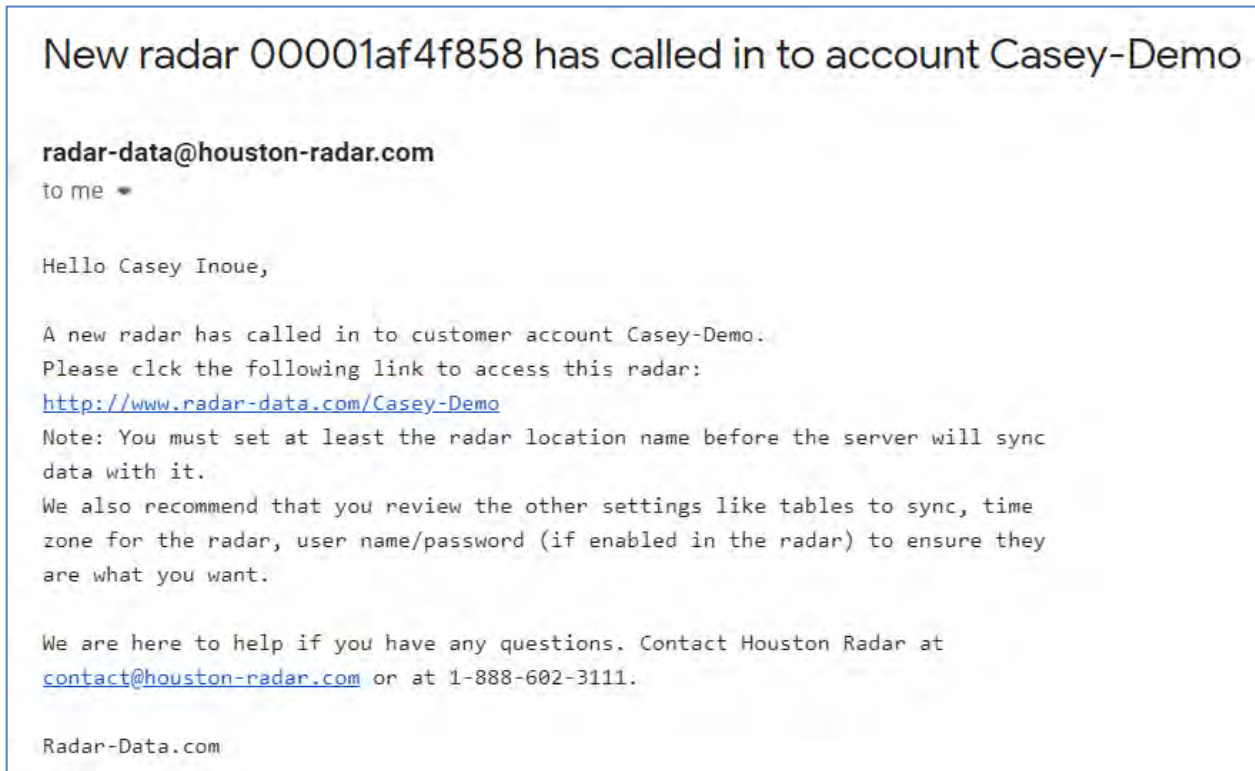
Connected Via: TCP/IP to:166.253.105.65

5.0 CONFIGURE LOCATIONS WITHIN TETRYON

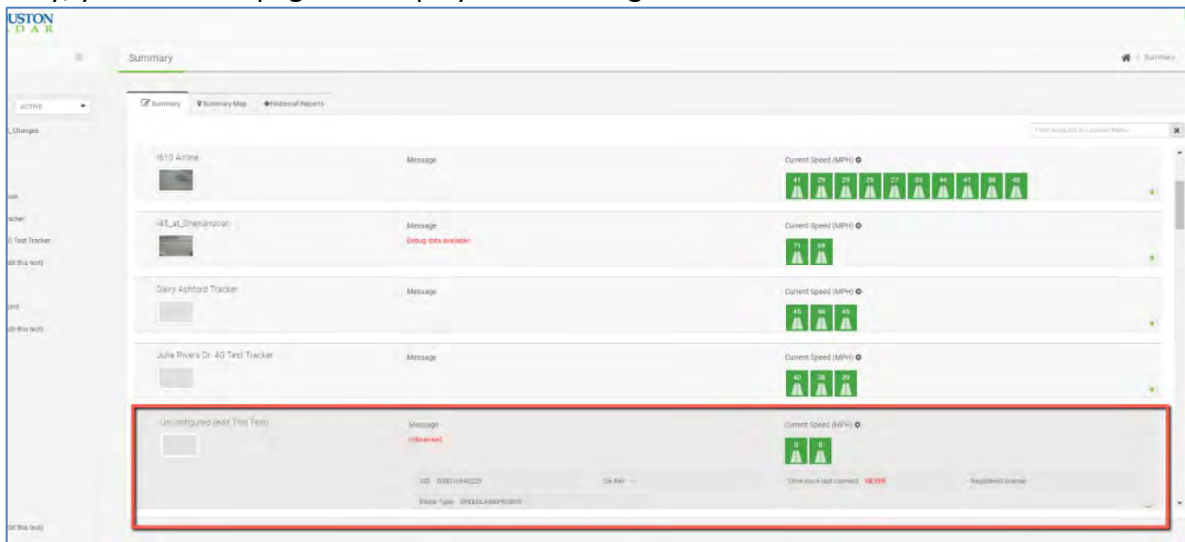
Each account in Tetryon has “Locations” that represent the physical address on the road where data was collected. You must associate exactly one radar to a Location that collects data at that point on the road. Once the radar calls in, Tetryon will sync data from the radar into this Location and aggregate data over time. If the radar needs to be replaced (or mobile/portable radars are being used), you must associate the radar currently on the road at that address with the “Location” in Tetryon.

Once you have created a Tetryon account and configured a device to communicate with Tetryon, you will set up that device within the Tetryon interface itself. Each radar that communicates with Tetryon is displayed as a Location and must be configured before it syncs data with the server.

When a new device contacts your Tetryon account, the account administrator will receive an emailed notice from radar-data@houston-radar.com:

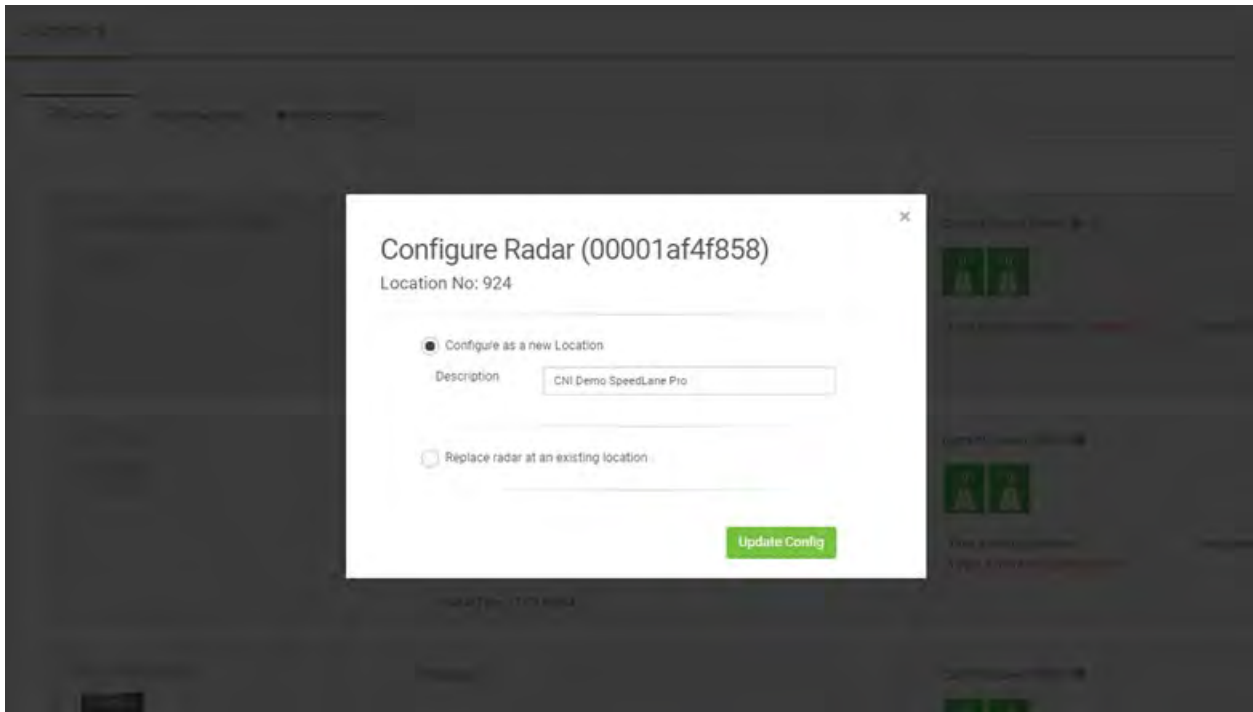


Simultaneously, your account page will display an “unconfigured” radar:

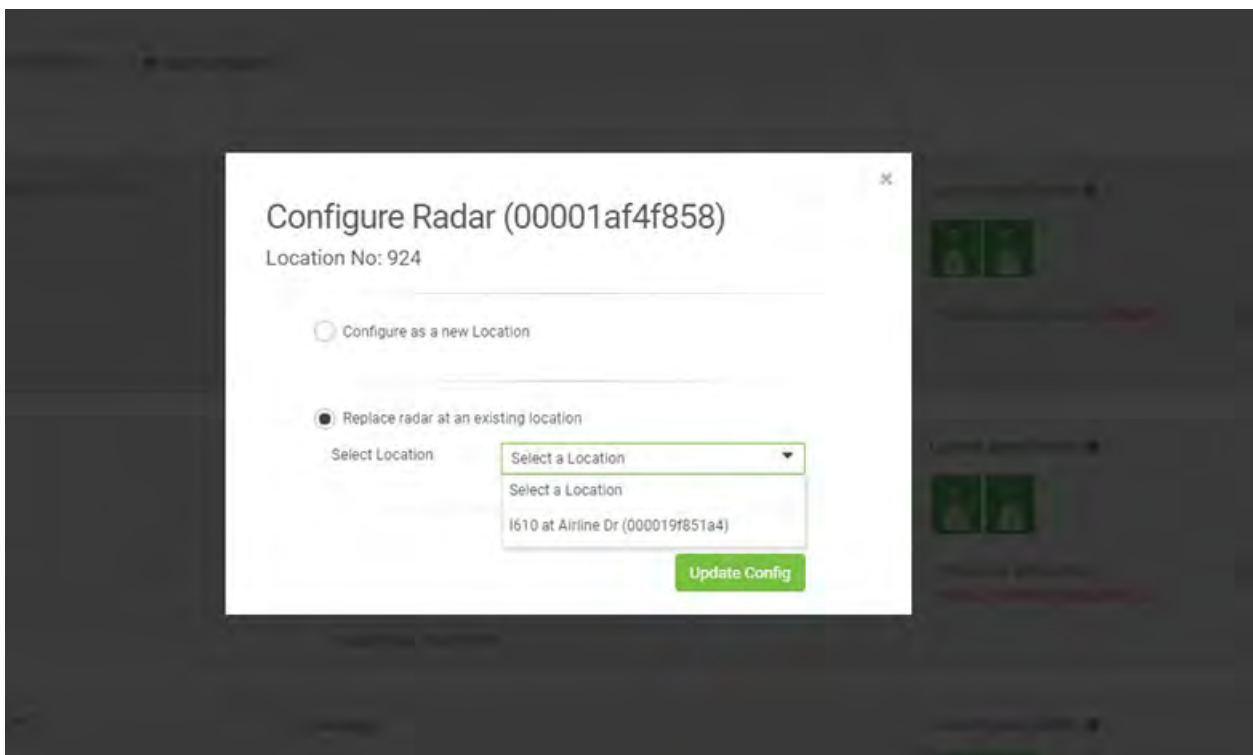


Click on the “Unconfigured (edit this text)” link. You will have an option to “Configure as a New Location” or “Replace Radar at an Existing Location”.

To configure the radar as a new Location, enter a user-defined description in the available field and select “Update Config”:



To replace an existing Location within Tetryon, select the appropriate Location from the available drop-down menu:



CAUTION! Selecting an existing Location will disassociate it from the previous radar that was syncing data into it and associate it with this new radar. Double check the Location you select before confirming this choice.

6.0 REPORTING

Tetryon provides a wide variety of commonly used data analysis options with detailed reports including Average Speed, 85th Percentile Speeds, Volume, diagnostic information, and several more options. Data can be analyzed on a per lane, direction, or groups of lanes basis in the SpeedLane Pro, and per direction or combined total in the Armadillo Tracker. Groups of lanes can be created or modified on demand and reports rerun.

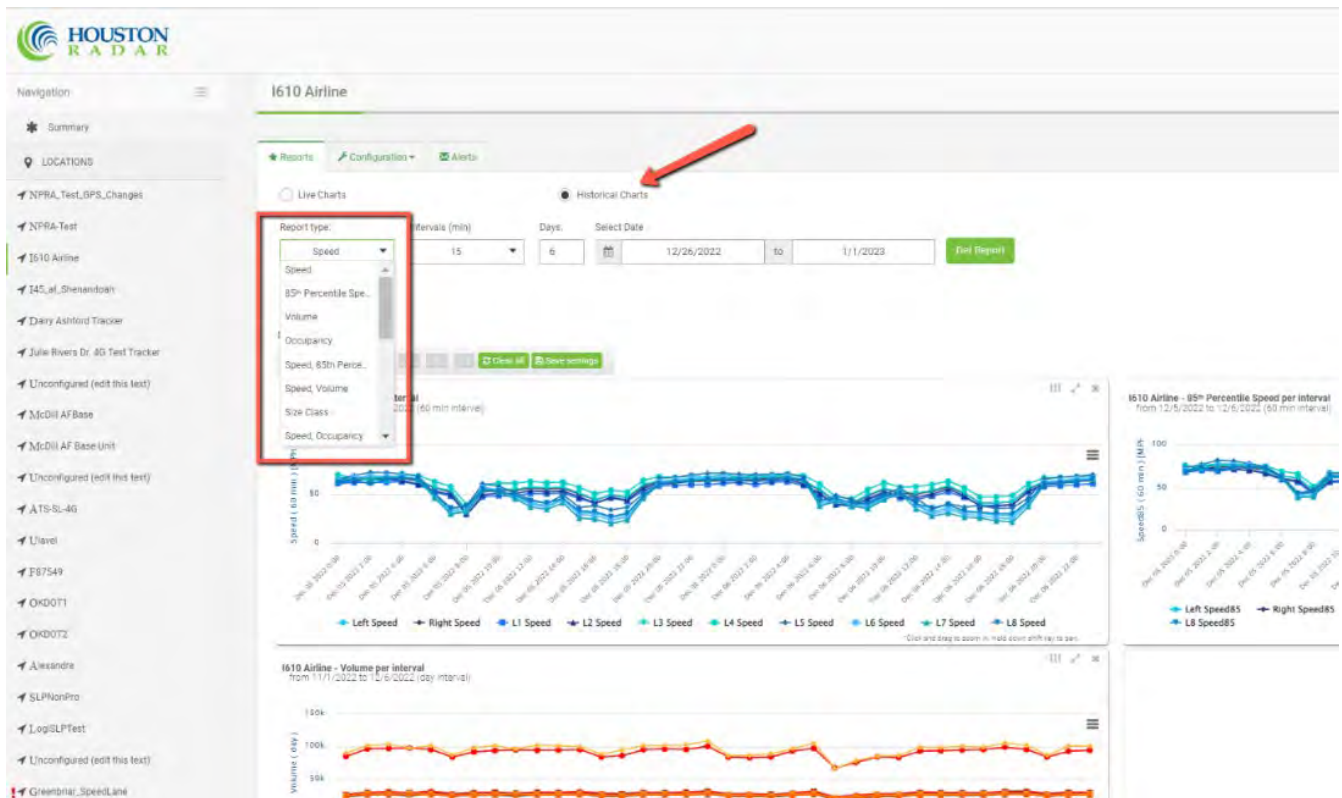
Each Location has options for analyzing data in Historical Charts and Live Charts. Users can also compare data from a combination of Locations in the user's account in Historical Reports.

Each user's chart layout is unique to that user account, and is saved across sessions. Live charts are dynamically updated when new data is sent to Tetryon, and this offers a convenient "dashboard view" to the user.

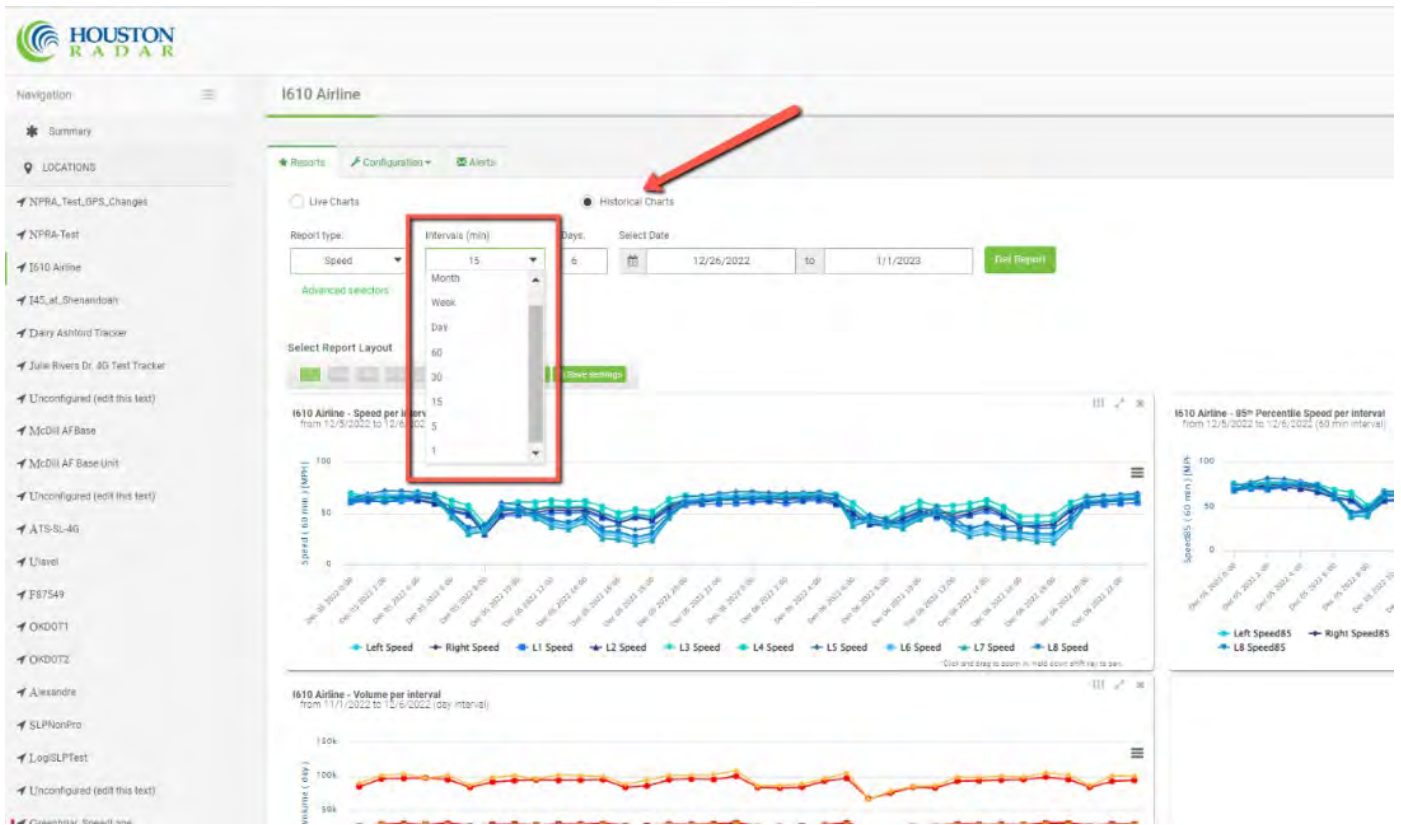
6.1 Historical Charts

Historical Charts provide the ability to view and analyze all data pushed from the radar. Each Location's historical data is stored in Tetryon's SQL database. There are up to 19x report types to choose from, with user-selectable values for Intervals and Timeframes. Charts are fully interactive, allowing for filtering, zoom, scrolling, and downloads. User-selected layout options are saved per user, and across login sessions.

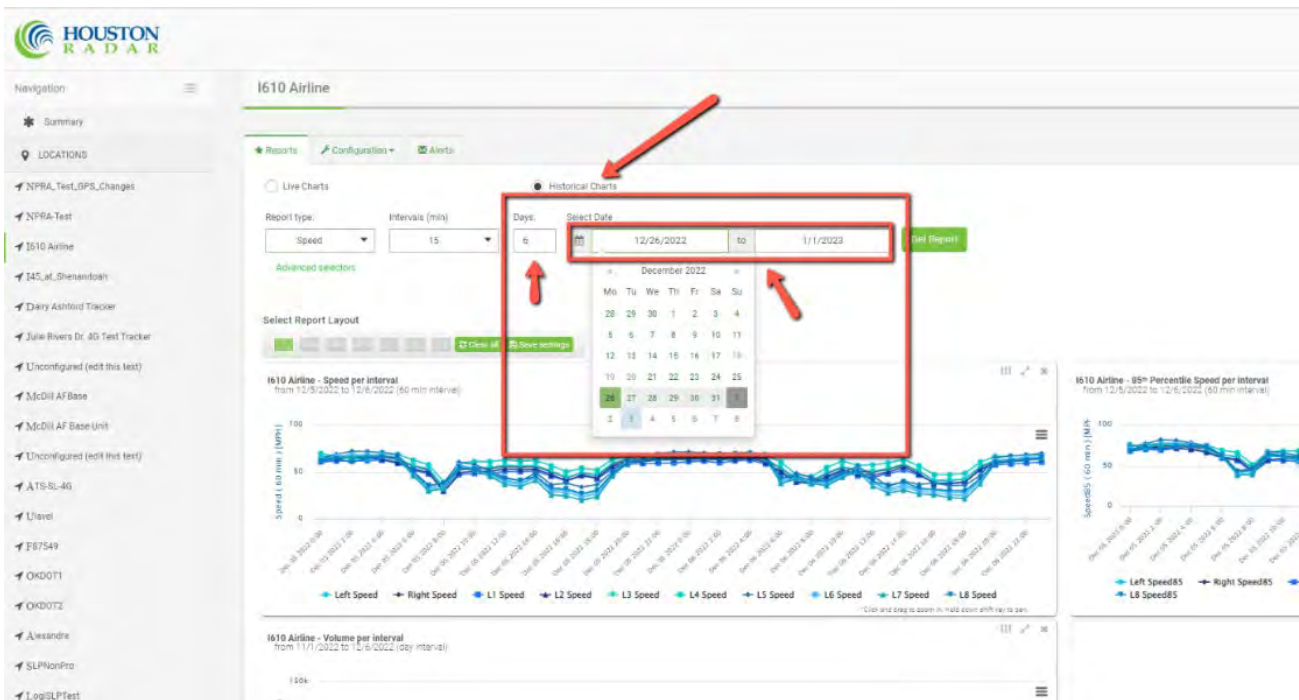
6.1.1 Historical Charts Report Type Menu:



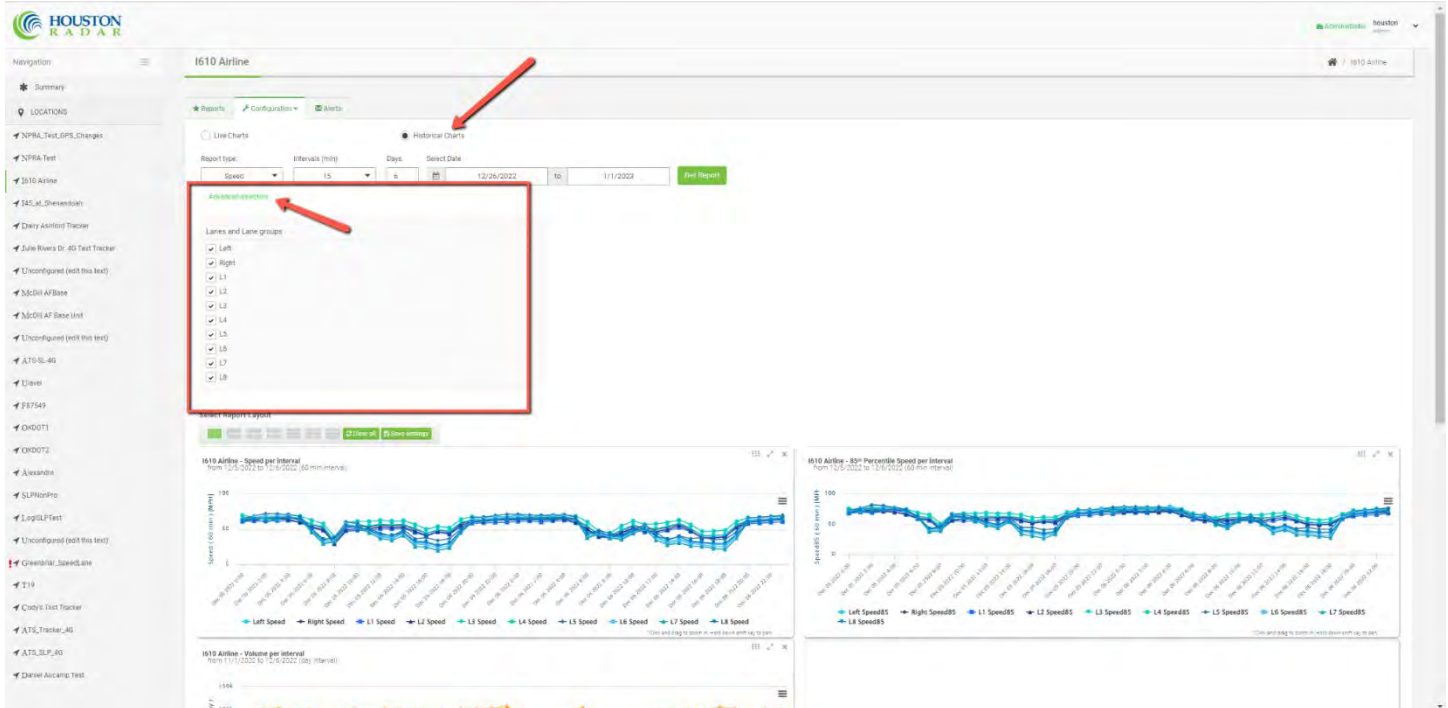
6.1.2 Historical Charts Report Intervals Menu:



6.1.3 Historical Charts Timeframes Options:



6.1.4 Historical Charts Advanced Selectors Options:



6.2 Historical Charts Report Types and Options Per Device

Following is a list of charts and reports available for each of the Armadillo Tracker and SpeedLane Pro within Historical Charts. Available intervals, timeframes, and filter options are listed next to each report below. Actual available charts, reports, and accompanying options are subject to change without notice.

6.2.1 Armadillo Tracker Historical Charts

Speed

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

85th Percentile Speed

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Volume

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed, Volume

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Class Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Temperature

- Any available historical timeframe Voltage
- Any historical

Timeframe Summary CSV export

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Raw Data CSV export (if using Targets)

- Any available historical timeframe
- Filterable by Lane Groups

Debug Data

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe

Weekly Report

- Intervals of 5, 15, 30, 60 min, day
- Any available historical timeframe
- Counts, Average Speed, 85th Percentile Speed, Speeder Counts, Average Speeder
- Filterable by Lane Groups
- Filterable by Classification

Weekly Speed Count

- Filterable by days and weeks
- Filterable by Lane Groups

Communication Error - Any available historical timeframe

6.2.2 SpeedLane Pro Historical Charts

Speed

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

85th Percentile Speed

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Volume

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Occupancy

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed, Volume

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed, Occupancy

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Class Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Temperature - Any available historical timeframe

Voltage - Any available historical timeframe

Summary CSV export

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Raw Data CSV export (if using Targets)

- Any available historical timeframe
- Filterable by Lane Groups

Debug Data

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe

Weekly Report

- Intervals of 5, 15, 30, 60 min, day
- Any available historical timeframe
- Counts, Average Speed, 85th Percentile Speed, Speeder Counts, Average Speeder
- Filterable by Lane Groups and Classification

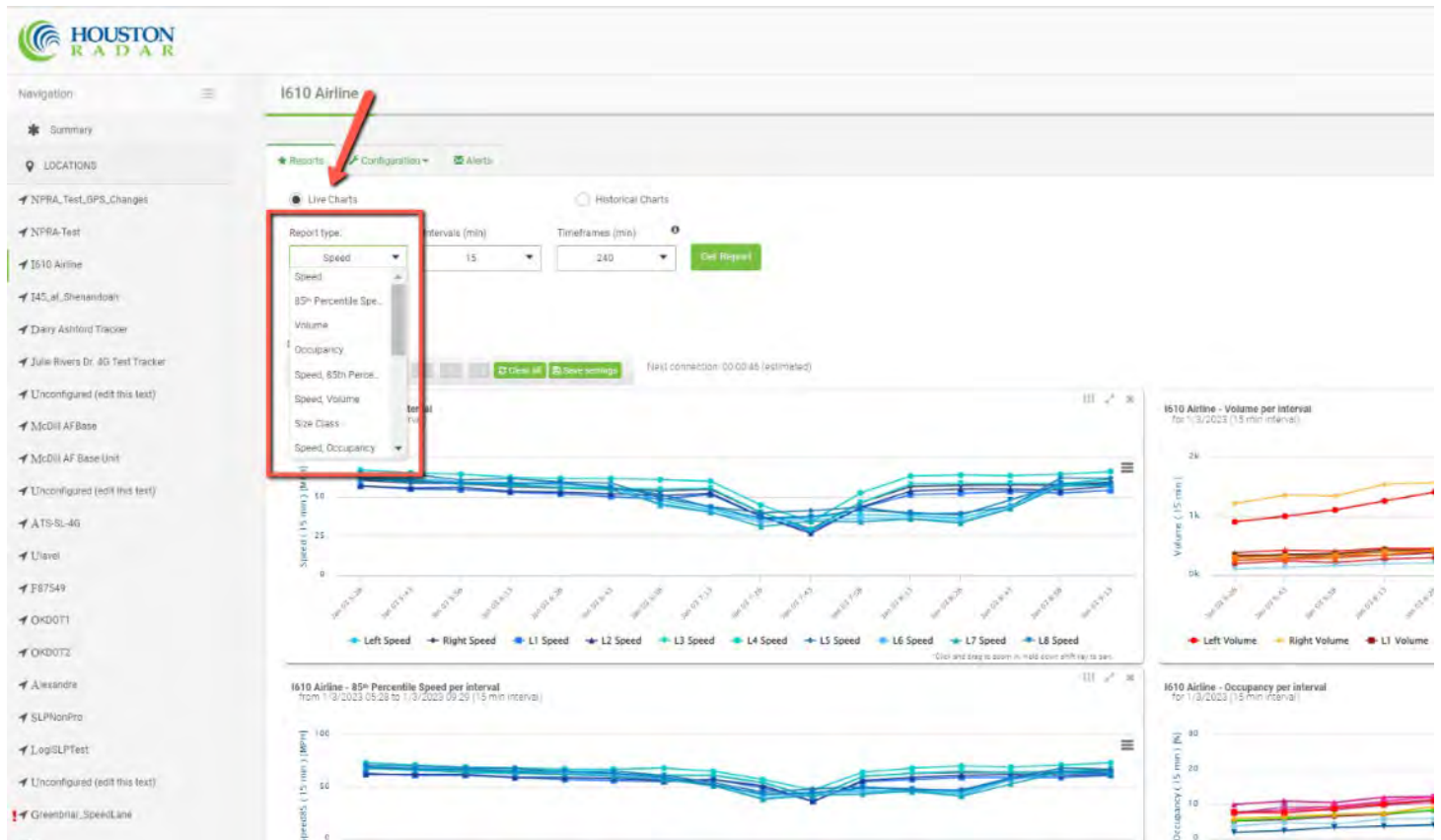
Images Report - Any available historical timeframe

Communication Error - Any available historical timeframe

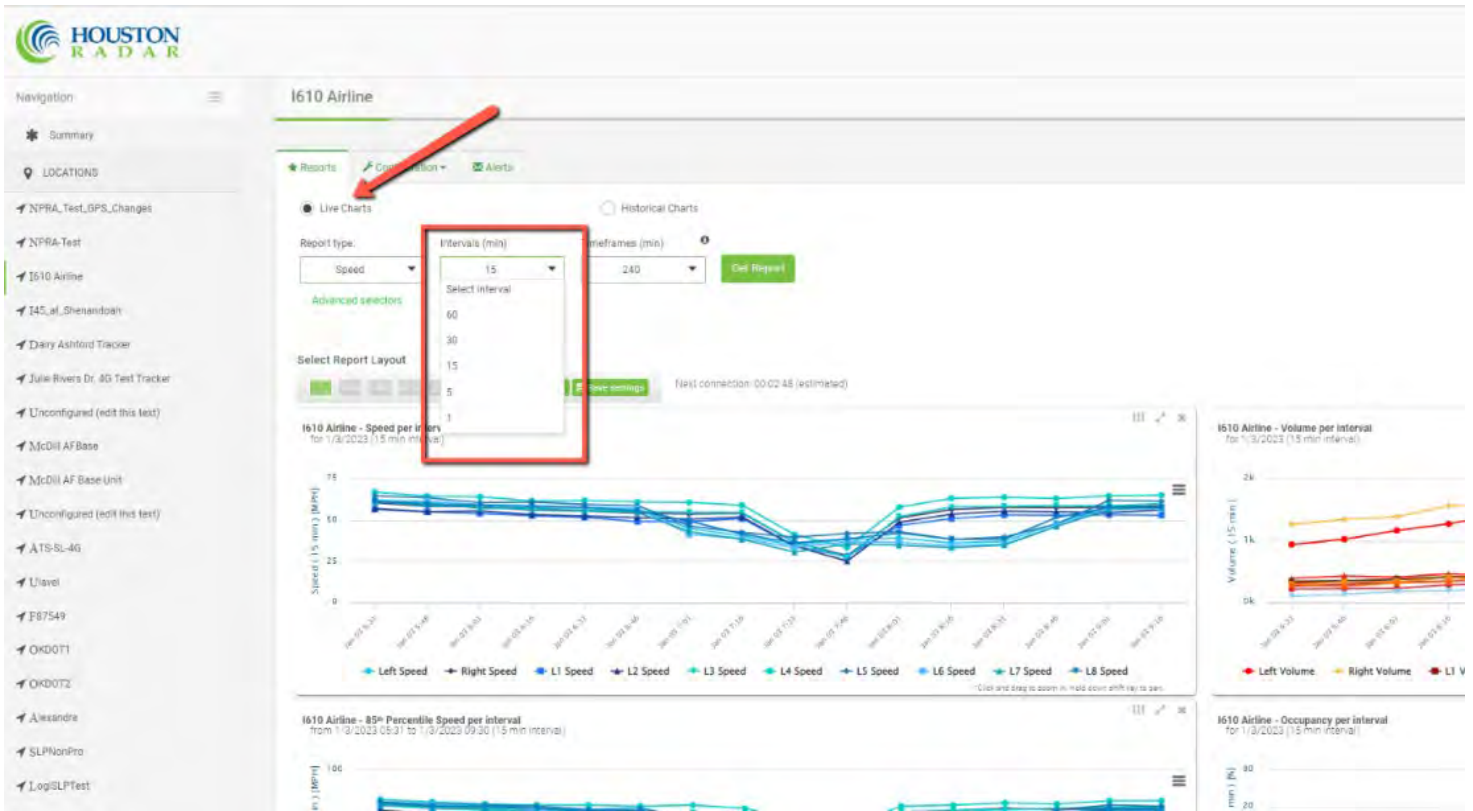
6.3 Live Charts

Live Charts provide the ability to view and analyze the last 4 hours of data pushed from the radar. Each Location's historical data is stored in Tetryon's SQL database. There are up to 17x report types to choose from, with user-selectable values for Intervals and Timeframes. Charts are fully interactive, allowing for filtering, zooming, scrolling, and downloads. Charts are dynamically updated when new data is received from the radar. User-selected layout options are saved per user, and across login sessions.

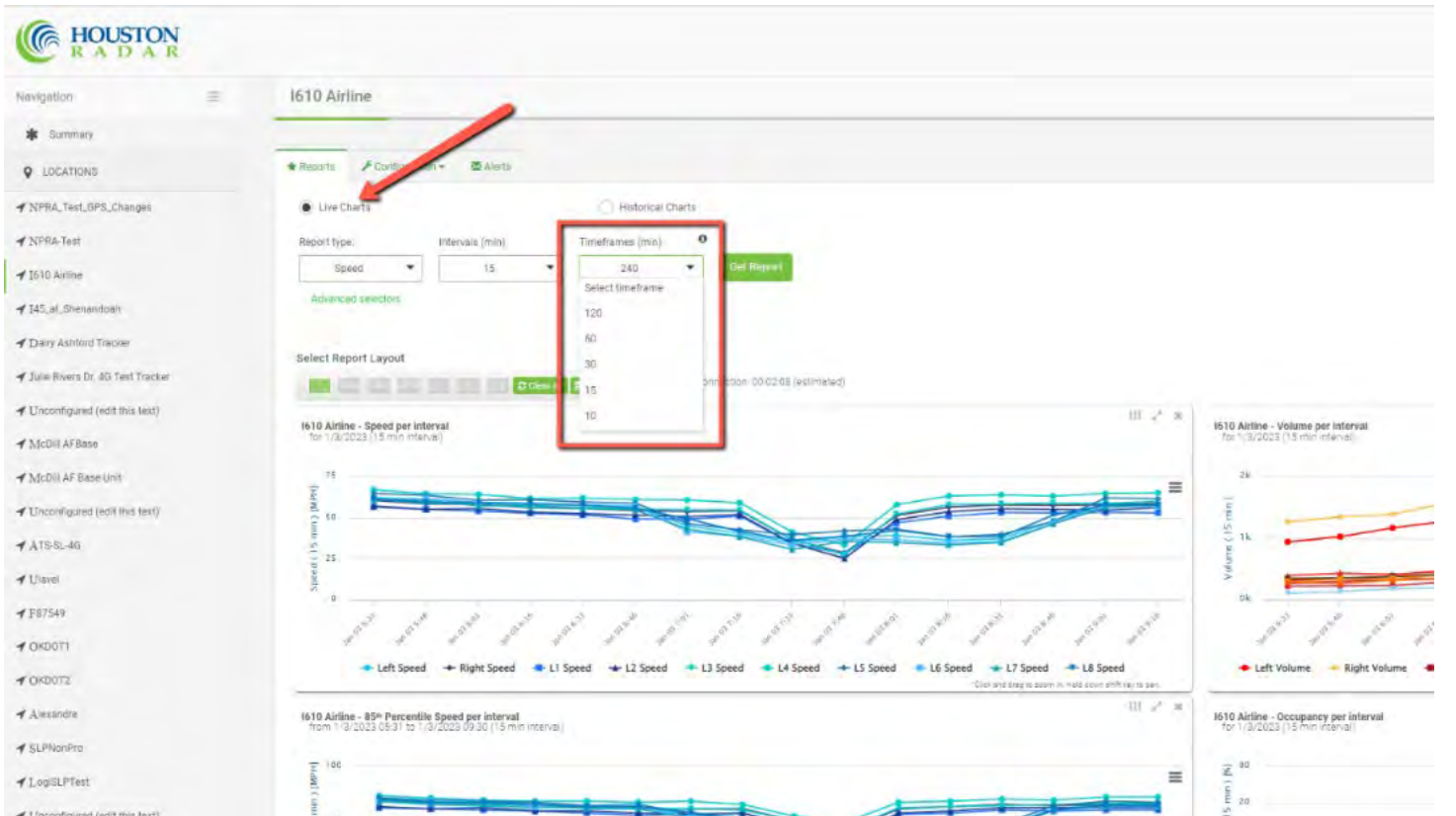
6.3.1 Live Charts Report Type Menu:



6.3.2 Live Charts Intervals Menu:



6.3.3 Live Charts Timeframes Menu:



6.3.4 Live Charts Advanced Selector Options:

6.4 Live Charts Report Types and Options Per Device

Following is a list of charts and reports available for each of the Armadillo Tracker and SpeedLane Pro within Live Charts. With each chart and report are listed the available intervals, timeframes, and filter options. Actual available charts, reports, and accompanying options are subject to change without notice.

6.4.1 Armadillo Tracker Live Charts

Speed

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

85th Percentile Speed

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Volume

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Occupancy

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Speed, Volume

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Speed Histogram

- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Class Histogram

- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Temperature

- Timeframe of 10, 15, 30, 60, 120, 240 min

Battery Status

- Timeframe of 10, 15, 30, 60, 120, 240 min

Voltage

- Timeframe of 10, 15, 30, 60, 120, 240 min

Summary CSV export

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Raw Data CSV export (if using Targets)

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Debug Data

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min

Weekly Report

- Intervals of 5, 15, 30, 60 min
- Counts, Average Speed, 85th Percentile Speed, Speeder Counts, Average Speeder
- Filterable by Lane Groups
- Filterable by Classification

6.4.2 SpeedLane Pro Live Charts

Speed

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

85th Percentile Speed

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Volume

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Occupancy

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Speed, Volume

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Speed, Occupancy

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Speed Histogram

- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Class Histogram

- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Temperature - Timeframe of 10, 15, 30, 60, 120, 240 min

Voltage - Timeframe of 10, 15, 30, 60, 120, 240 min

Snapshot

- Intervals of 5, 15, 30, 60 min
- Resolution of 320x240, 640x480, 800x600, 1280x960

Summary CSV export

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Raw Data CSV export (if using Targets)

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min
- Filterable by Lane Groups

Debug Data

- Intervals of 5, 15, 30, 60 min
- Timeframe of 10, 15, 30, 60, 120, 240 min

Weekly Report

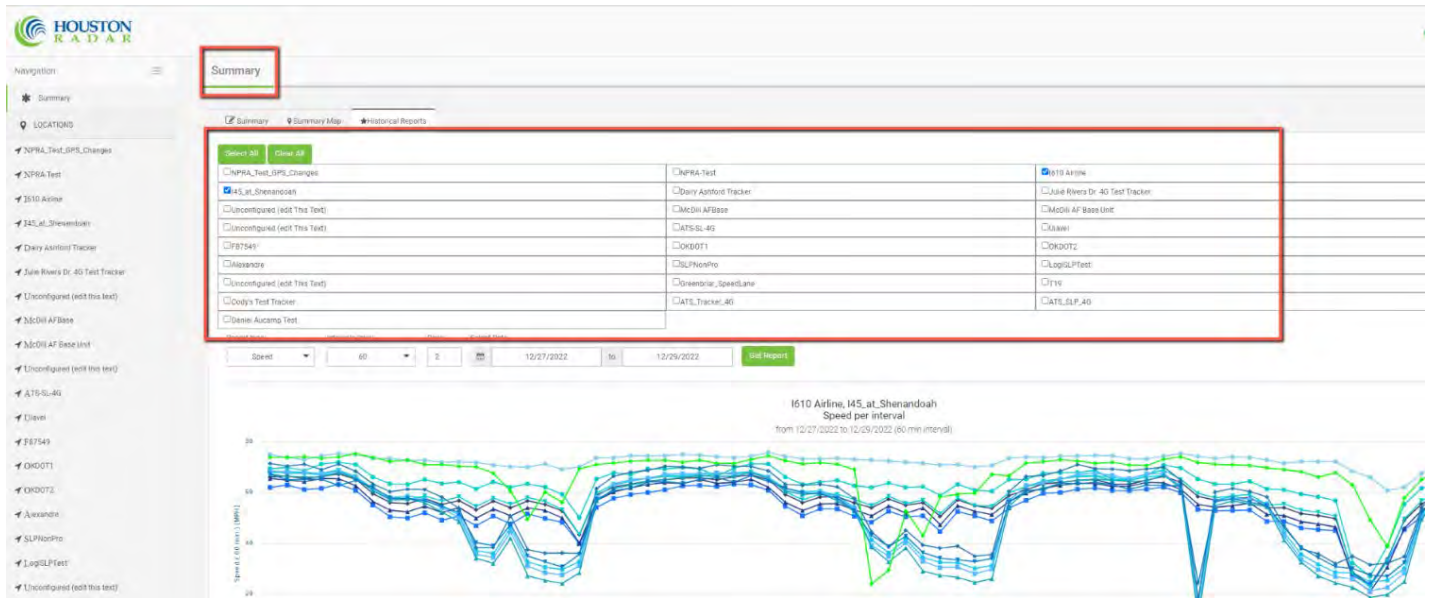
- Intervals of 5, 15, 30, 60 min
- Counts, Average Speed, 85th Percentile Speed, Speeder Counts, Average Speeder
- Filterable by Lane Groups and Classification

Images Report

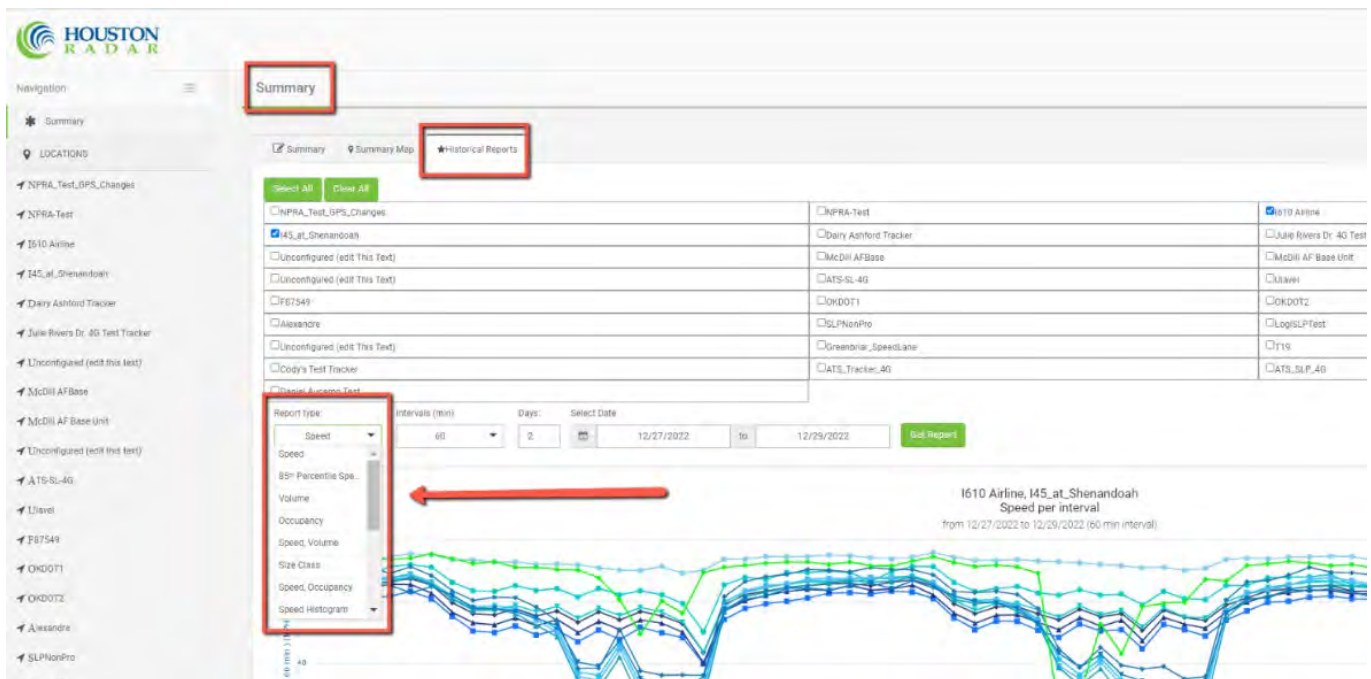
6.5 Summary Historical Reports

Historical Reports are accessed from the Summary Pane, and provide the ability to view and analyze historical data pushed from the radar that is more than 4 hours old. Each Location's historical data is stored in Tetryon's SQL database. There are up to 16x report types to choose from, with user-selectable values for Intervals and Timeframes. Charts are fully interactive, allowing for filtering, zooming, scrolling, and downloads. Charts are dynamically updated when new data is received from the radar. User-selected layout options are saved per user, and across login sessions.

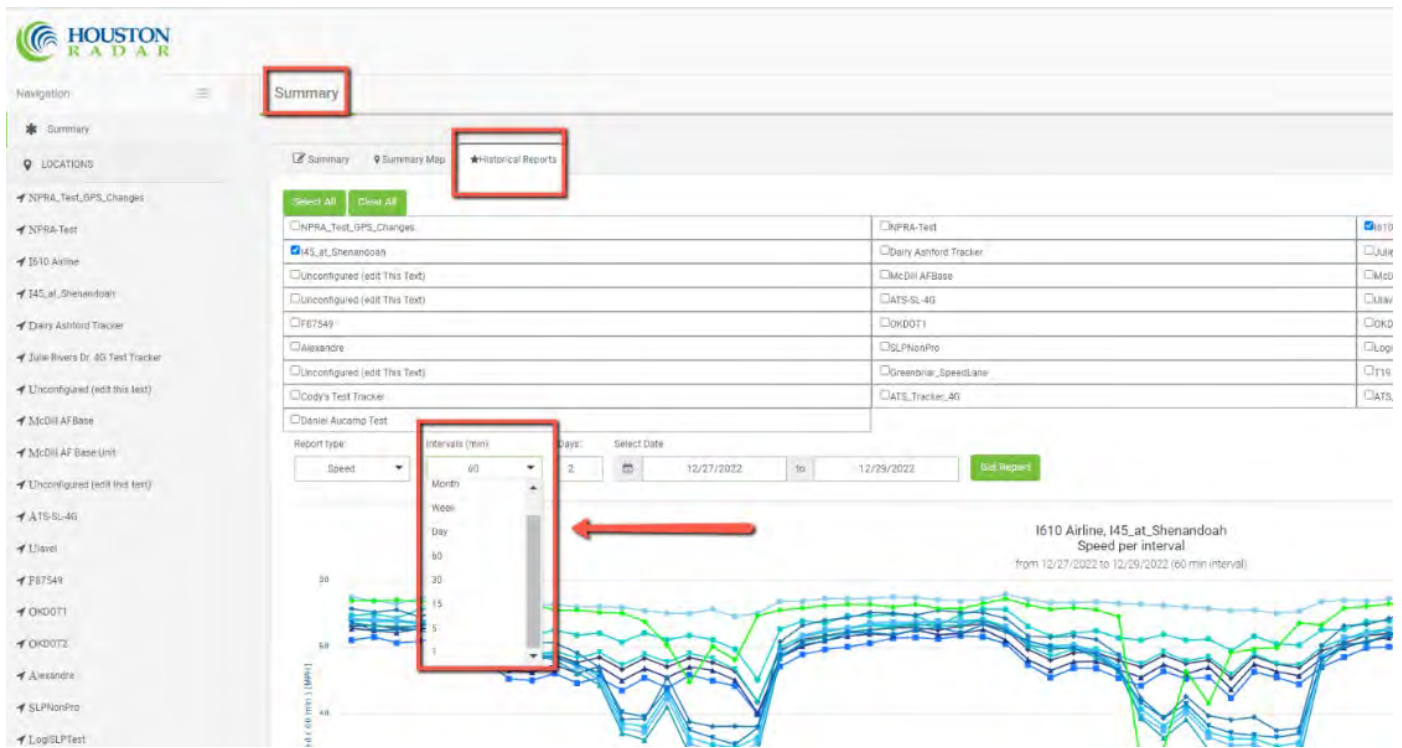
6.5.1 Summary Historical Reports Location selection:



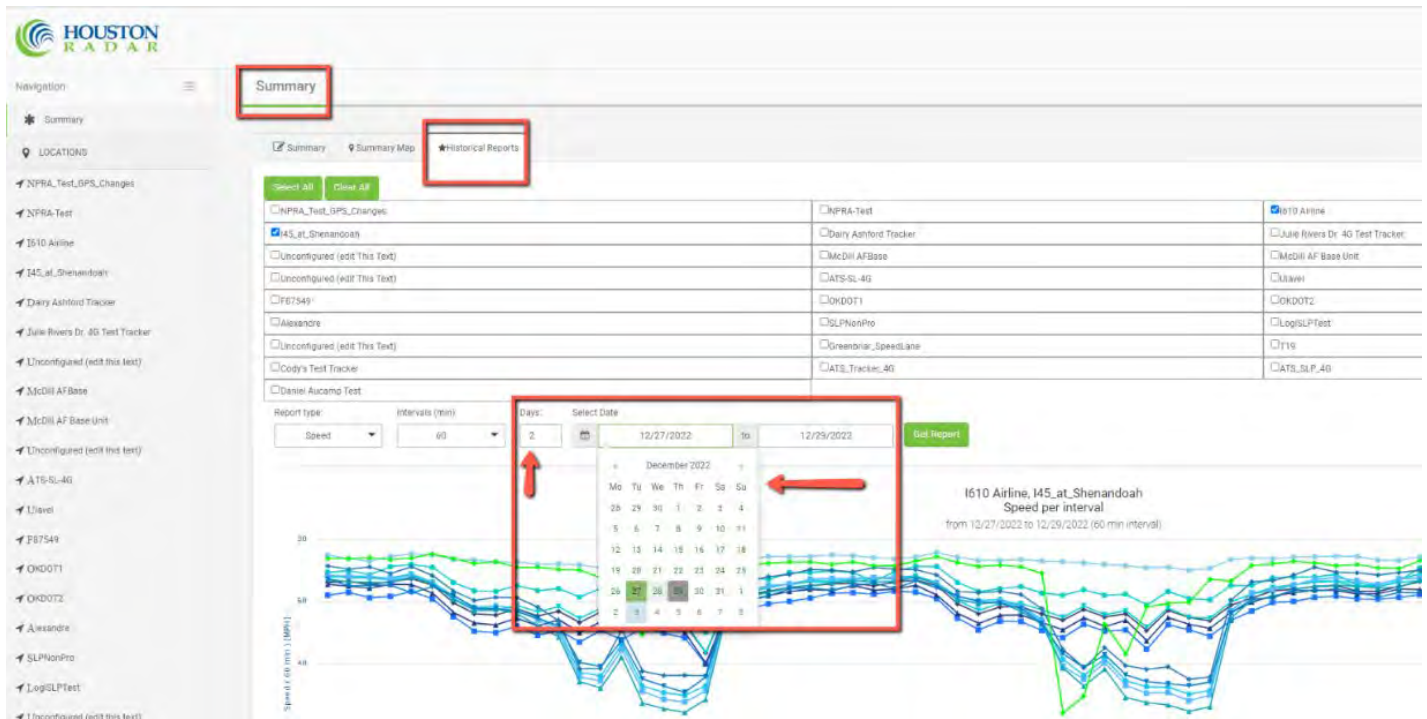
6.5.2 Summary Historical Reports Report Type Menu:



6.5.3 Summary Historical Reports Intervals Menu:



6.5.4 Summary Historical Reports Timeframes Options:



6.5.5 Armadillo Tracker Summary Historical Reports

Speed

- Intervals of 1, 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

85th Percentile Speed

- Intervals of 1, 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Volume

- Intervals of 1, 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed, Volume

- Intervals of 1, 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Class Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Temperature

- Any available historical timeframe

Battery Status

- Any available historical timeframe

Voltage

- Any available historical timeframe

Summary CSV export

- Intervals of 1, 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Raw Data CSV export (if using Targets)

- Any available historical timeframe
- Filterable by Lane Groups

Debug Data

- Intervals of 1, 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe

Communication Error

- Any available historical timeframe

6.5.6 SpeedLane Pro Summary Historical Reports

Speed

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

85th Percentile Speed

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Volume

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Occupancy

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed, Volume

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed, Occupancy

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Speed Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Class Histogram

- Any available historical timeframe
- Filterable by Lane Groups

Temperature - Any available historical timeframe

Voltage - Any available historical timeframe

Summary CSV export

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe
- Filterable by Lane Groups

Raw Data CSV export (if using Targets)

- Any available historical timeframe
- Filterable by Lane Groups

Debug Data

- Intervals of 5, 15, 30, 60 min, day, week, month
- Any available historical timeframe

Weekly Report

- Intervals of 5, 15, 30, 60 min, day
- Any available historical timeframe
- Counts, Average Speed, 85th Percentile Speed, Speeder Counts, Average Speeder
- Filterable by Lane Groups and Classification

Images Report - Any available historical timeframe

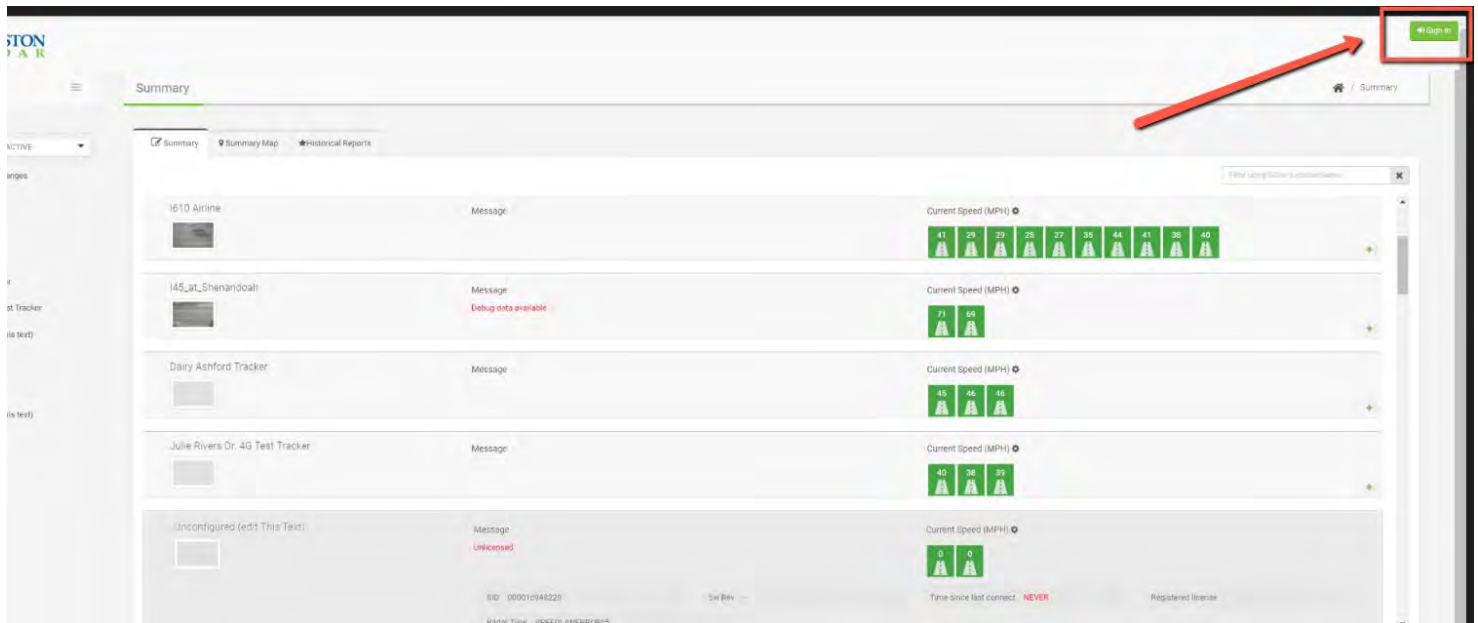
Communication Error - Any available historical timeframe

7.0 HOME PAGE NAVIGATION

7.1 Home Page

Tetryon's Home Page is the first screen you will see when you use your browser to navigate to your account's unique URL. There is some basic information you can see on the Home Page without signing in, but most of the functionality will not be available until you sign in.

Tetryon's Sign In function is in the top right corner of your Home Page:

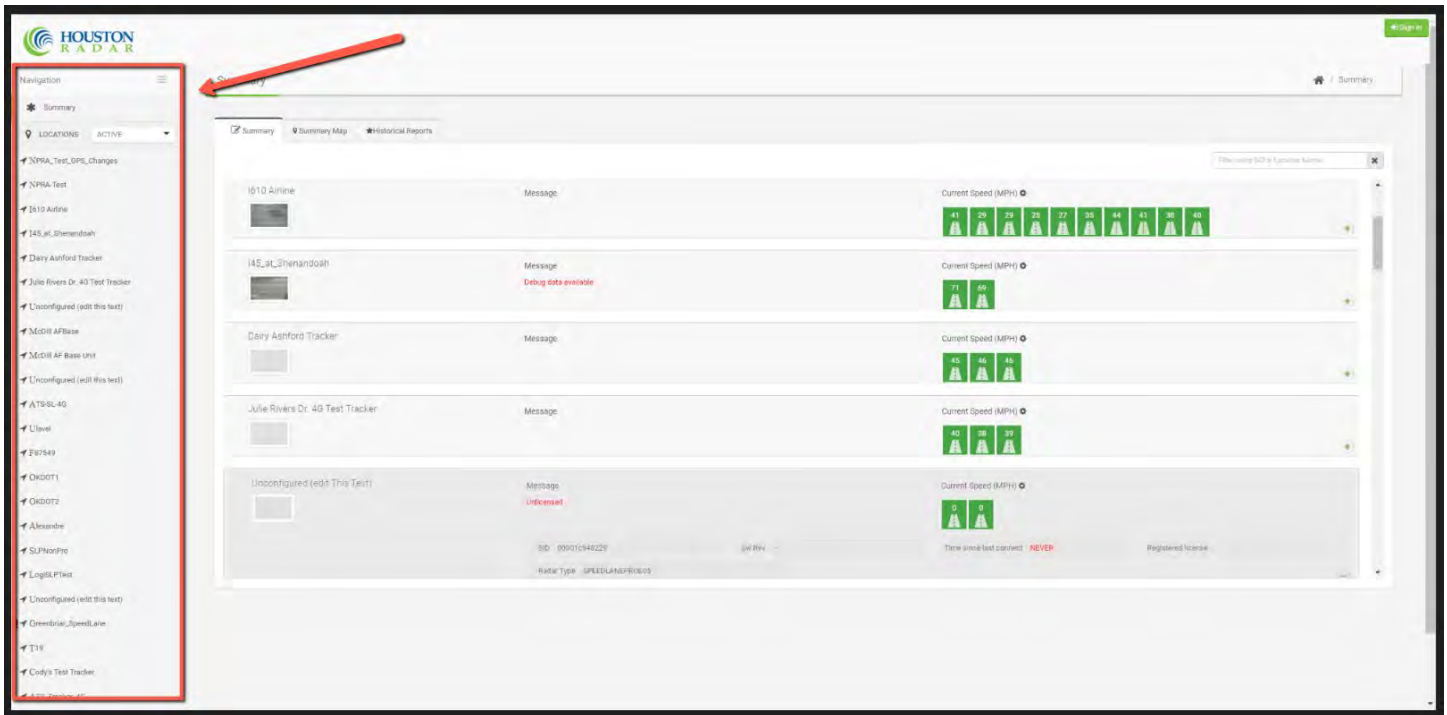


Once you click the Sign In button, enter the username and password information provided when you created your account.

After signing in, you will have access to three points of navigation from the Home Page, depending on your User Level: Navigation Pane, Summary Pane, and Administrator Dashboard.

7.2 Navigation Pane

The Navigation Pane is on the left side of your screen, and is viewable from every screen within Tetryon except the Administrator pages.



The Navigation Pane provides a list of Locations in your Tetryon account, using the user-defined description for each Location. You can access any of these Locations by clicking on a description within the Navigation Pane.

The list of Locations in the Navigation Pane can be filtered for Active, Archived, or both using the drop-down menu at the top of the Navigation Pane. Locations that are Active are associated with a radar configured to call into Tetryon on a user-defined interval. Locations that are Archived have either been Closed and Replaced (see Sections 5.0 and 10.1) or manually Archived by a user (see Section 10.2), and are no longer associated with a radar configured to call into Tetryon. Filtering for Locations in the Navigation Pane allows you to declutter your list of Locations for easier navigation.

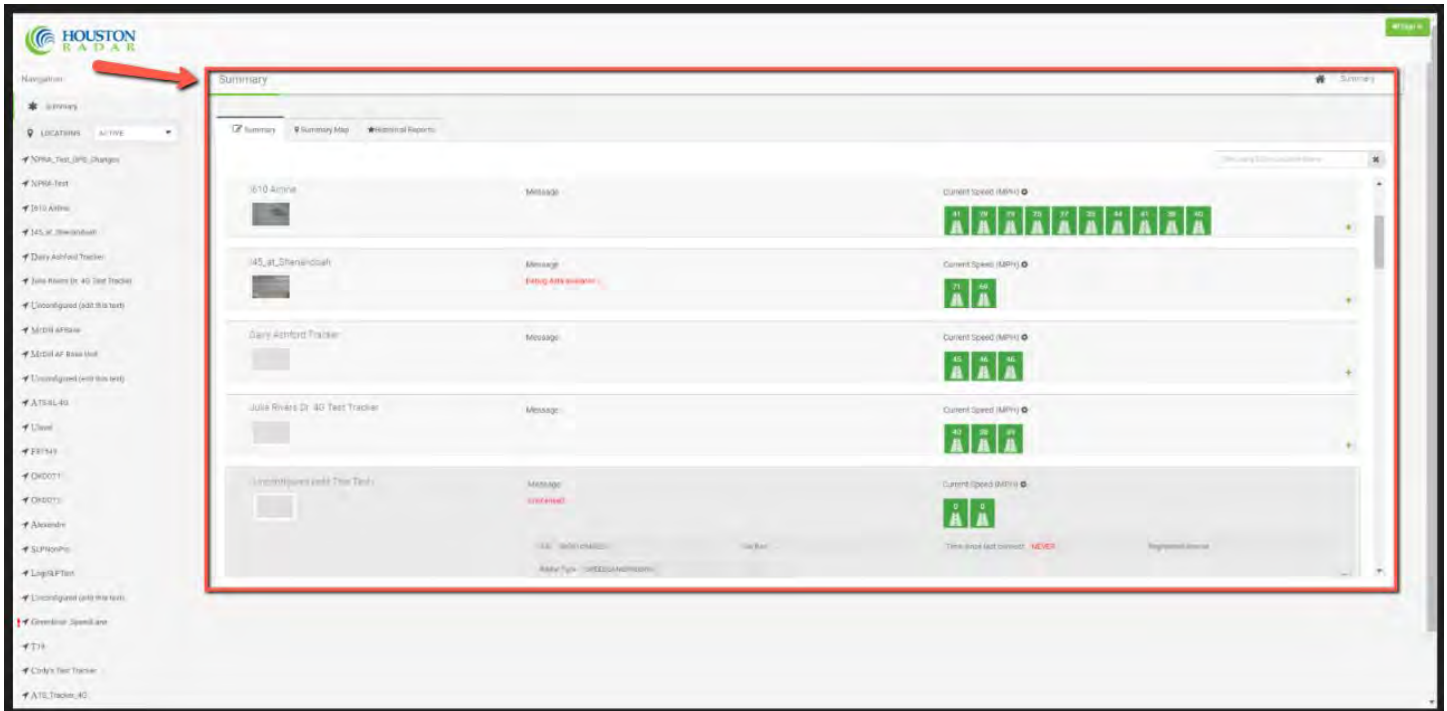
Clicking the Summary button at the top of the Navigation Pane will take you back to the Home Page.

The Navigation Pane can be collapsed by clicking the three-line button at the top of the Navigation Pane:




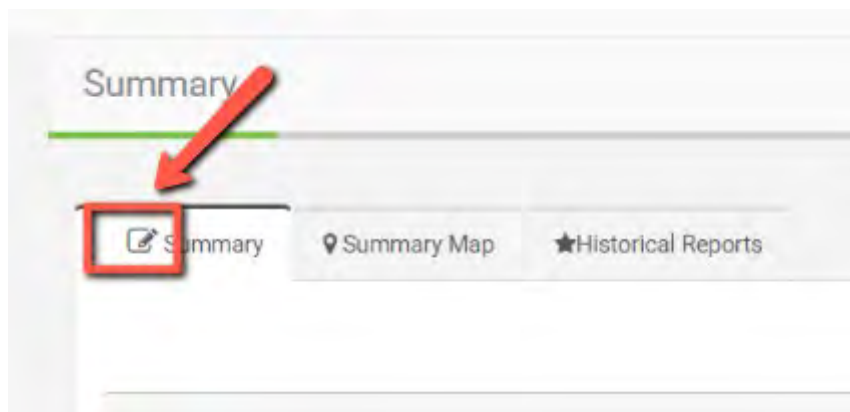
7.3 Summary Pane

The Summary Pane is in the middle of your Home Page. The Summary Pane provides a sortable view for all Locations, a Location search feature, an interactive Map, Summary Historical Reports, and additional information for each Location that is not available from the Navigation Pane. The additional Location information includes recent average speed for defined Lane Groups, radar identification information, “last connect” timer, and an image from the radar’s built-in video camera (if available).



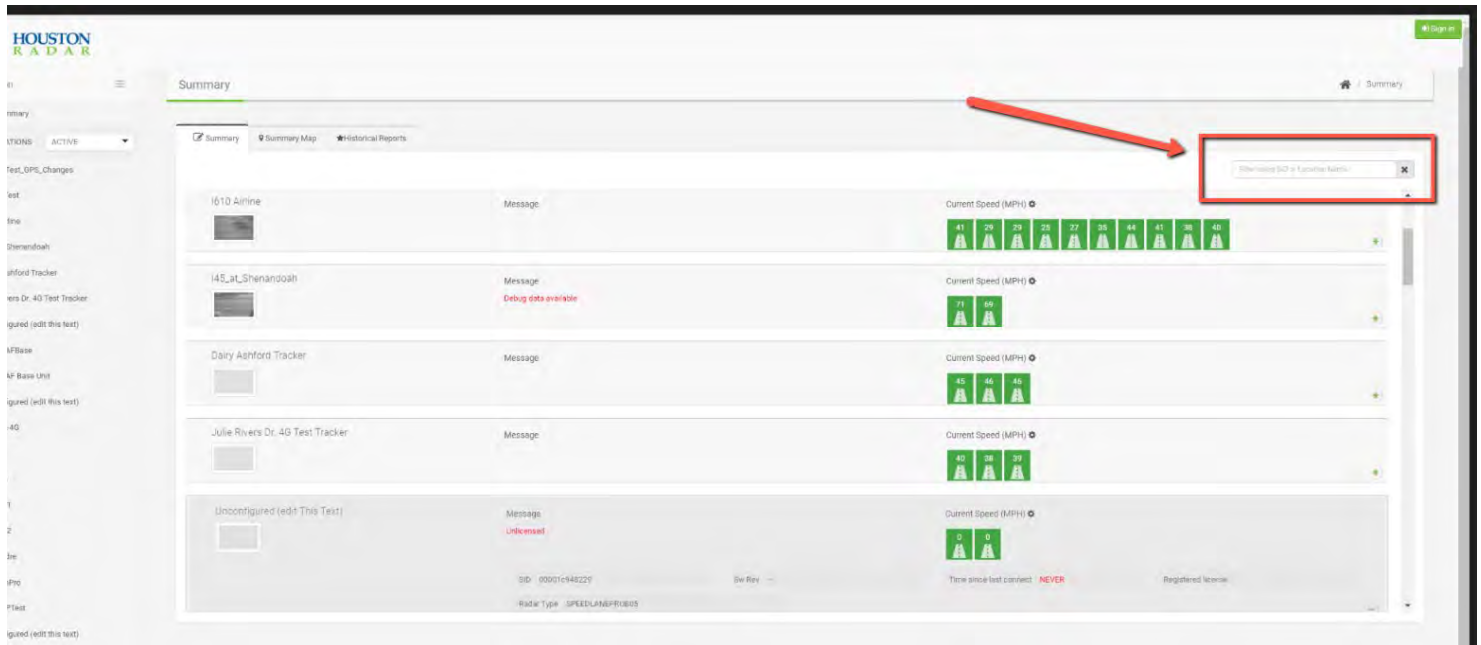
7.3.1 Summary Tab

To reorder the list of Locations in the Summary Tab, click on the Edit icon  on the Summary tab:




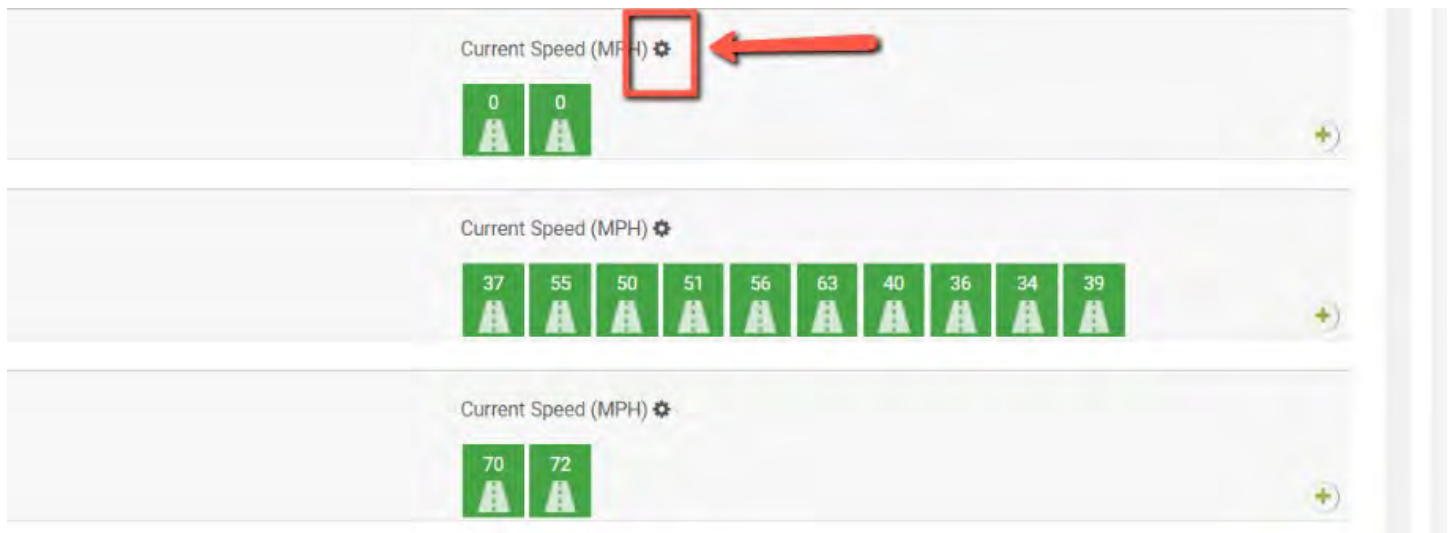
Available options for adjusting the Locations list includes Ascending, Descending, and manual ordering.

To search for a particular Location, or to filter the list of Locations, utilize the Search/Filter field in the top right corner of the Summary Pane:



Tetryon will search all Location descriptions, radar SID's, and Tags for the string of characters entered in this field, and it is not case-sensitive. For example, if you search for the characters "1234" the display will change to display Locations named "1234 Main Street," "Highway 1234," or with an SID of "9991234000."

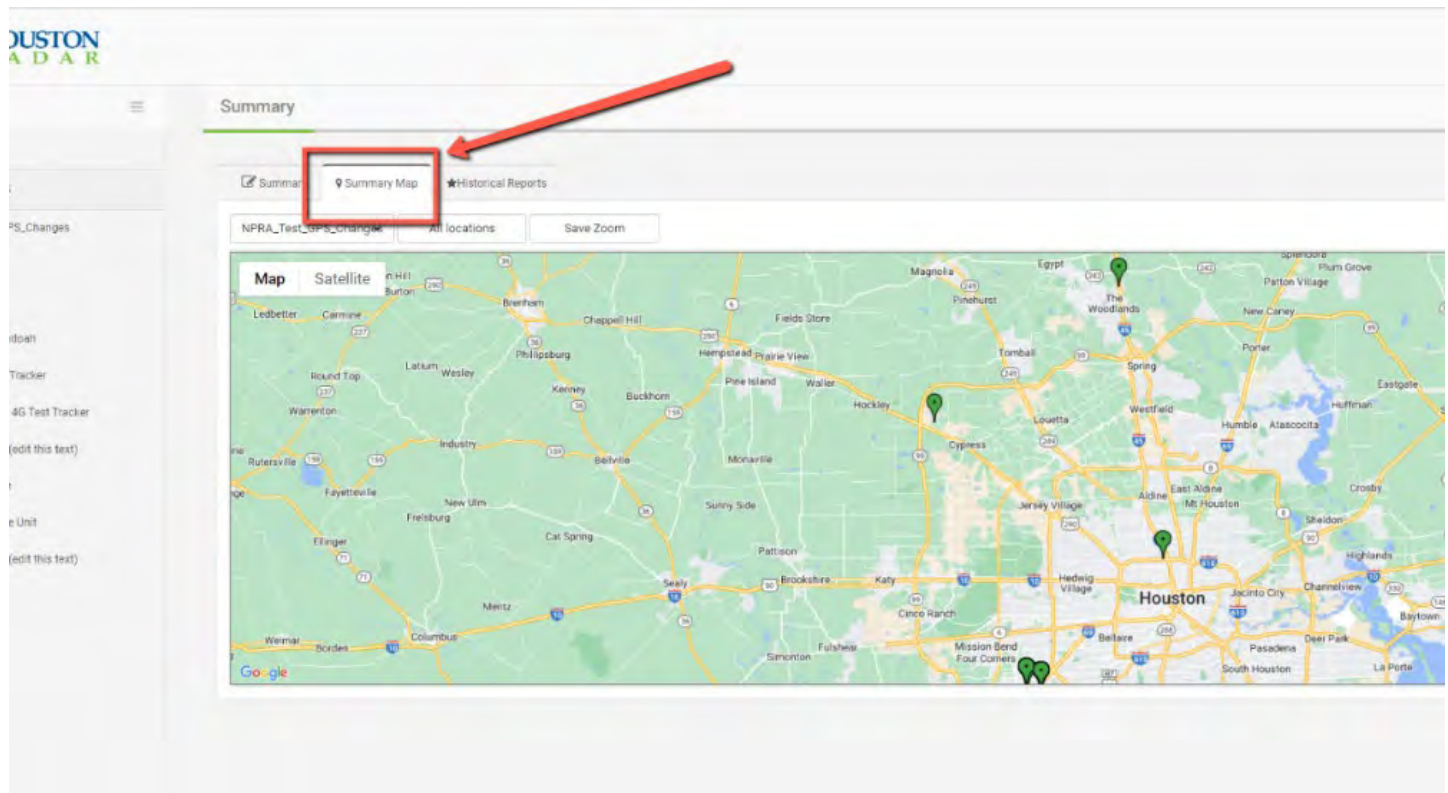
The Summary Pane's Summary Tab can provide the user color-coded visual alarms for abnormal average speeds. To set up this visual alarm, click on the gear icon  above the Lane Group Average Speed icons. Set the values desired in the resulting window. The value displayed in the Summary view is averaged over the interval specified in the "Interval (mins)" field.



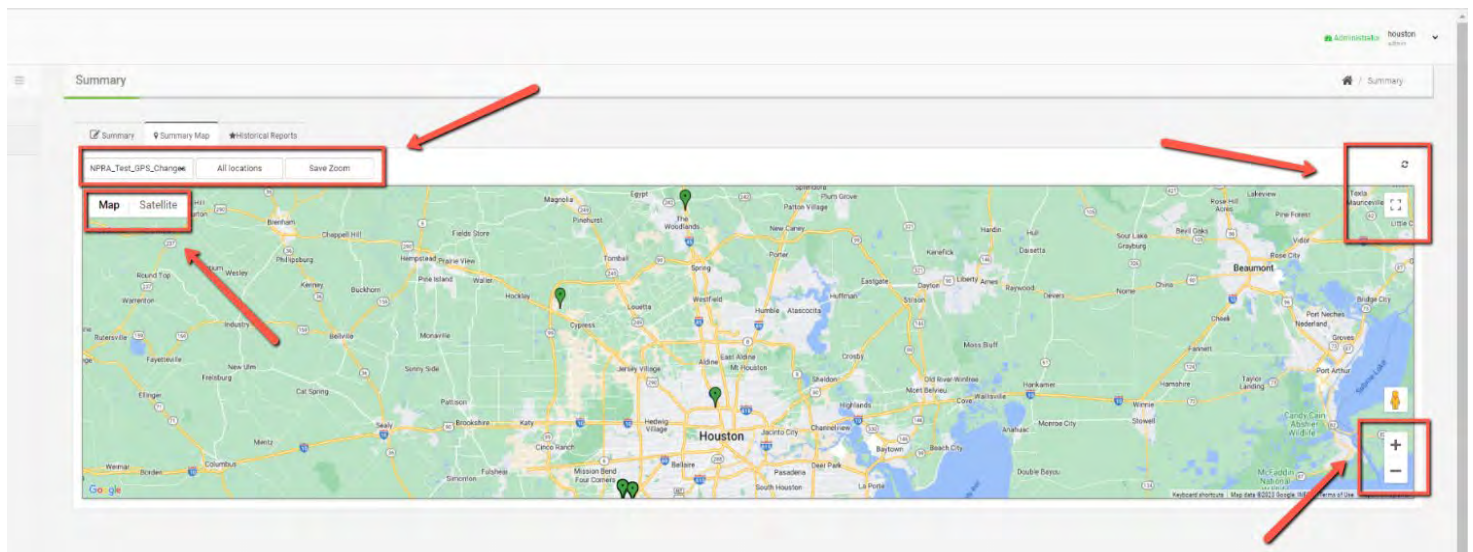
The Summary Tab's view will auto-refresh approximately every one minute. Any Location whose Summary view is manually expanded will automatically collapse upon refresh.

7.3.2 Summary Map

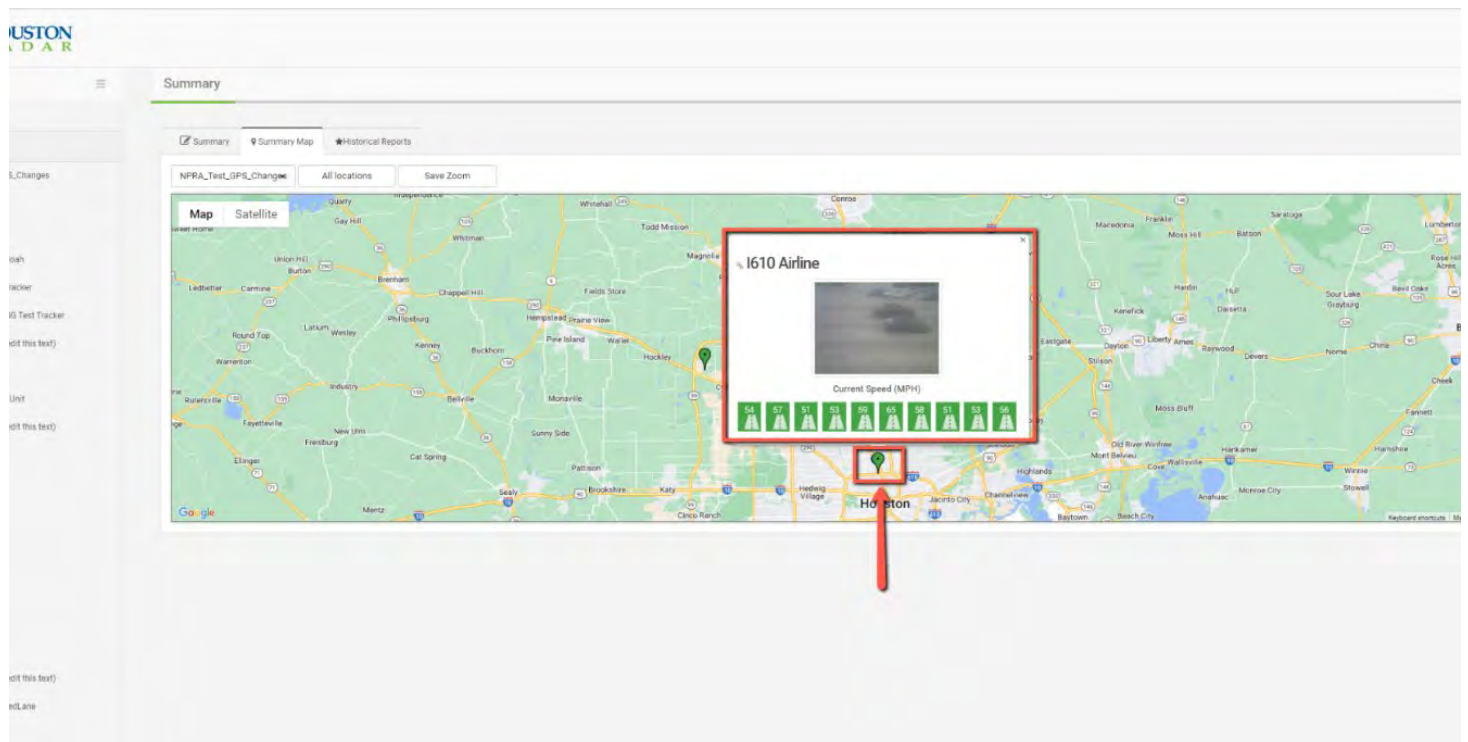
The Summary Pane's Summary Map provides an interactive Google map with pushpins designating each Location:



There are several Summary map options for adjusting the view and scope of the Summary Map including a drop-down menu listing all Locations, the ability to view All Locations at once, and Google Maps features such as Satellite and Streets views.



You can click on the Location pushpins in the Summary Map to view much of the same information as found in the list view:

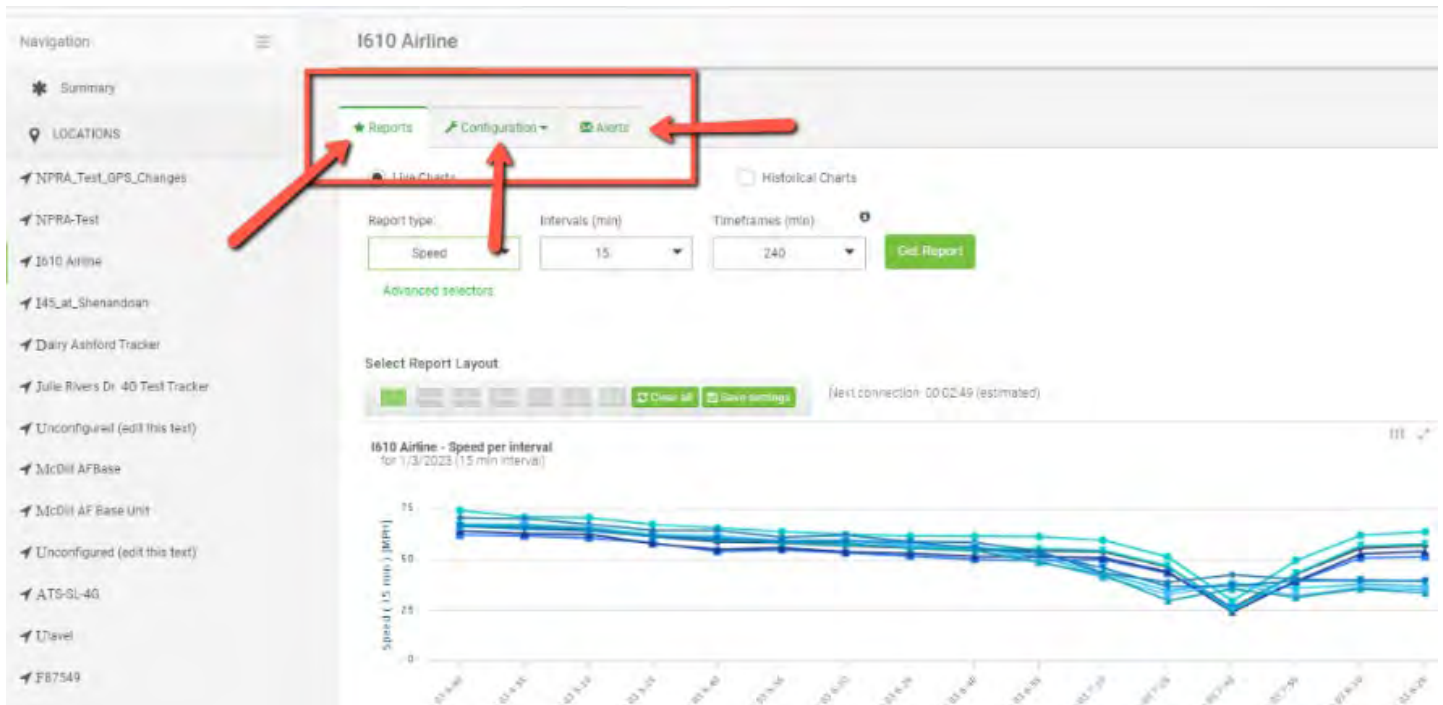


7.3.3 Summary Historical Reports

Please see Section 6.5 for more information on Summary Historical Reports.

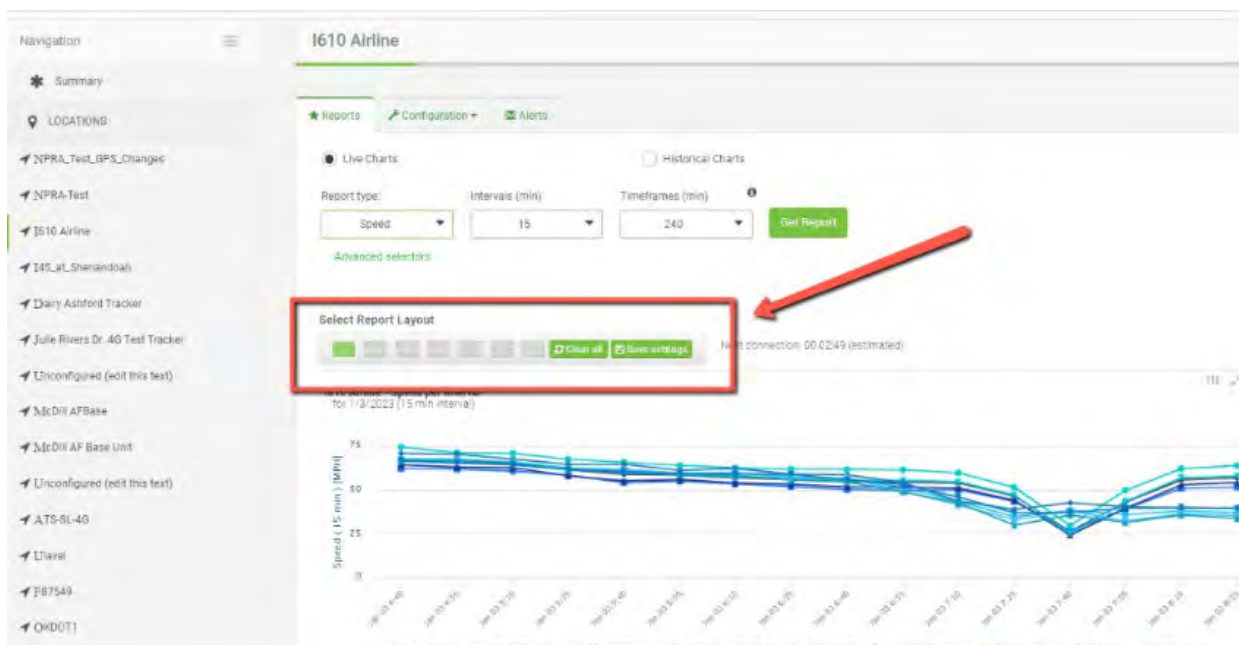
8.0 LOCATION PAGE NAVIGATION

The Location Page provides access to individual radar data, Location-specific settings and customization, and alerting features for individual Locations. Access to features is determined by a user's assigned permission level.



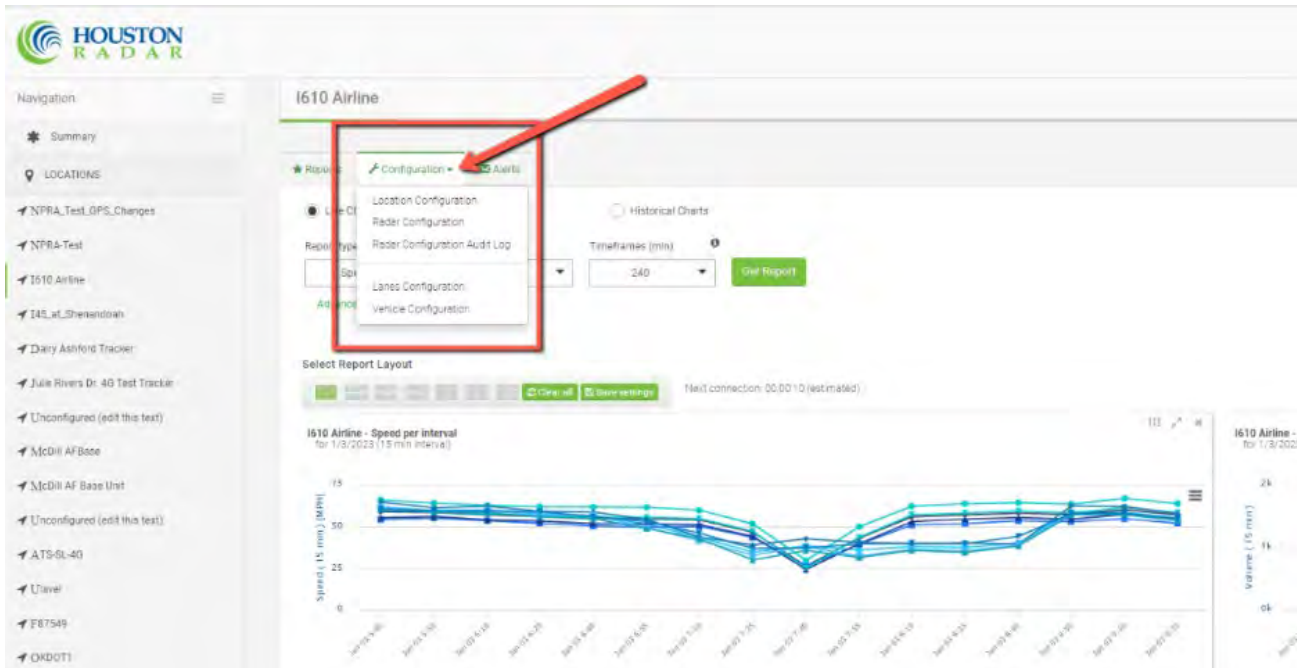
8.1 Reports Tab

Each Location offers Live Charts and Historical Charts to view, analyze, and export data from the radar. Please see Sections 6.3 and 6.4 for more information on Historical Charts and Live Charts. Each user can save a customized Report Layout in Historical Charts and Live Charts.



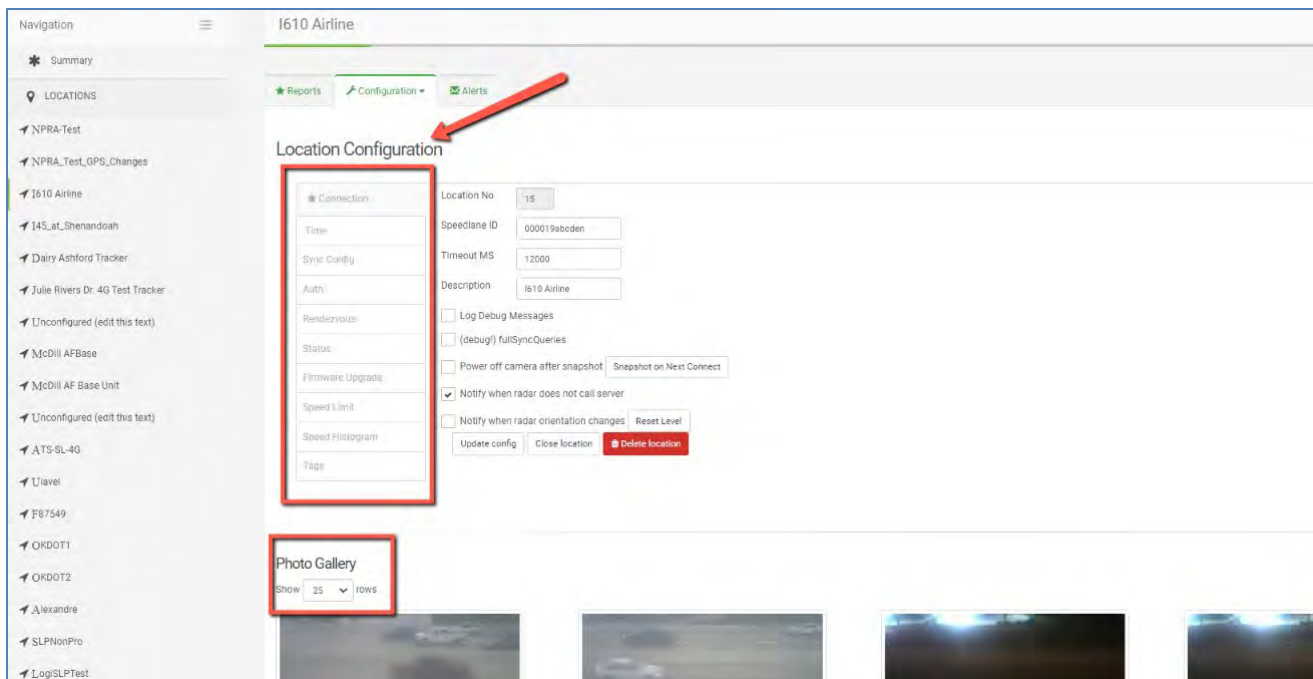
8.2 Configuration Tab

The Location Configuration tab grants access to various Location-specific settings and customizable features. The Configuration Menu includes separate pages for Location Configuration, Radar Configuration, Radar Configuration Audit Log, Lanes Configuration, and Vehicle Configuration. Access to features is determined by a user's assigned permission level.

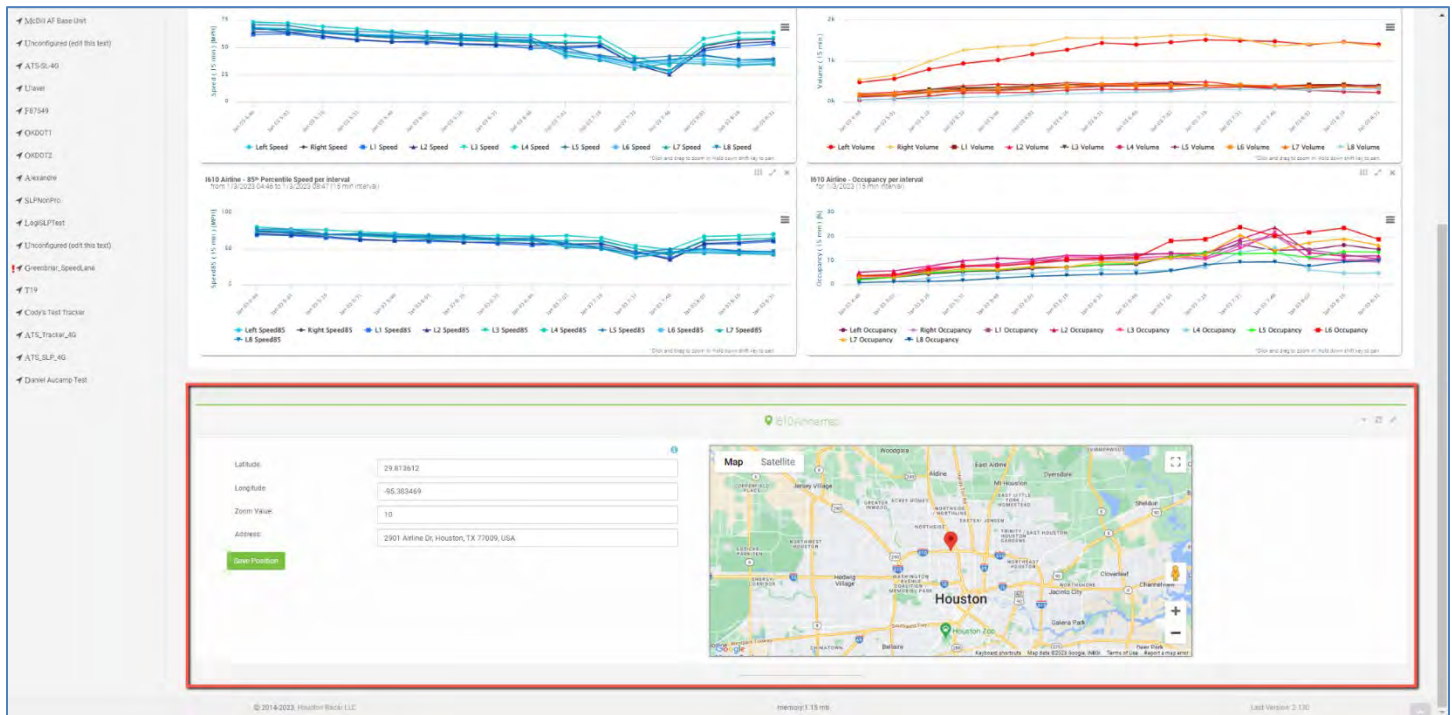


8.2.1 Location Configuration

The Location Configuration page provides ten menu options, images pushed from the radar (if applicable) in a Photo Gallery, and a Location Map at the bottom of the page.



Location Map:



The Location Configuration pages include these commands on multiple screens:

- Update Location: command to save changes from this screen
- Close Location: please see Section 10.1 for additional information on Closing Locations
- Delete Location: command to remove this Location from the Tetryon account

8.2.1.1 Location Configuration – Connection

- Location No: value assigned by Tetryon, representing the unit in chronological order
- SpeedLane ID: value imported by Tetryon from the radar; this ID is the radar's Silicon Identification (SID), and is not the same value as the radar's Serial Number.
- Timeout MS: amount of time, in milliseconds, Tetryon waits for a valid response from the radar; if Timeout MS has elapsed and no response has come back from the radar, Tetryon will automatically retry the command/request to the radar.
- Description: user-defined name assigned to the Location when originally configured in Tetryon; can be edited from this screen
- Log Debug Messages: turns ON verbose logging of SQL queries for debugging purposes; do not enable unless instructed by Houston Radar support personnel.
- (debug!) fullSyncQueries: forces Tetryon to resend pre-stored queries to the radar; do not enable unless instructed by Houston Radar support personnel.
- Power off camera after snapshot (Snapshot on Next Connect): sends command to radar to take a picture with its internal video camera (if applicable), and then switch off to save power.
- Notify when radar does not call server: sends an email notification to the account Supervisor or Site Administrator when this Location does not contact Tetryon at its user-defined interval.
- Notify when radar orientation changes (Reset Level): sends an email notification to the account Supervisor or Site Administrator when the radar is physically adjusted.

8.2.1.2 Location Configuration – Time

- Server maintains radar time: Tetryon will review and change, as necessary, the radar internal clock so that the radar internal clock maintains its observed offset at the time this box is selected (i.e. correcting for clock drift).
- Observed offset from UTC: value imported from radar internal clock, relative to UTC; if the radar clock is adjusted, this value will update after the following connection
- Select Your Timezone: value independent of the radar internal clock, and only affects the time used on reports within Tetryon
- *Application Note: Tetryon uses the “Observed offset from UTC” value from the radar to store timestamps in UTC inside the Tetryon database. Once all timestamps are stored in UTC, Tetryon can generate reports based on the time zone selected by the user in the Select Your Timezone menu.*

8.2.1.3 Location Configuration – Sync Config

- Sync records a maximum of days since last connect: user-defined value for the number of days’ worth of missed data to sync between the radar and Tetryon in the event of a prolonged communication outage, and the number of days to read from the Radar when a location is first configured
- Config: radar configuration variables used by Tetryon to generate charts and reports
- Intervals: Per Lane Volume, Average Speed, Occupancy, Gap, and Headway values used by Tetryon to generate Volume, Speed, Occupancy charts and reports
- Targets: check to sync individual vehicle records; required for Raw Data CSV downloads
- Status: radar status information such as when radar was powered up, hourly voltage, temperature, and battery level indication used by Tetryon to generate Voltage, Temperature and Battery Level charts
- classHistogram: Per Lane Volume by size class used by Tetryon to generate Class Histogram and Class Size charts and reports
- speedHistogram: Per Lane Volume by speed bins used by Tetryon to generate Speed Histogram charts and reports
- directionHistogram: Per Lane Volume by direction

8.2.1.4 Location Configuration – Auth

- Username & Password: required if a username and password is configured in a SpeedLane Pro; if a username and password is configured in the SpeedLane Pro, Tetryon cannot talk to the radar without this information

8.2.1.5 Location Configuration – Rendezvous

- Rendezvous with radar on next connect: enables Tetryon’s Rendezvous feature for this radar; please see Section 11 for information on Tetryon’s Rendezvous feature

8.2.1.6 Location Configuration – Status

- Current SW Rev: radar firmware version
- Last Connected: timestamp for Tetryon’s last successful connection with the radar
- KB TX: amount of data, in kilobytes, sent from Tetryon to the radar since this counter was last cleared
- KB RX: amount of data, in kilobytes, received by Tetryon from the radar since this counter was last cleared
- TX/RX last cleared: timestamp of when the RX/TX counters were most recently cleared
- Bytes This Week: amount of data, in bytes, exchanged between Tetryon and the radar in the current calendar week
- KB This Month: amount of data, in kilobytes, exchanged between Tetryon and the radar in the current calendar month
- KB Last Week: amount of data, in kilobytes, exchanged between Tetryon and the radar in the previous calendar week
- Peer Address: IP address of the radar; if the radar has an internal or external modem, then this is the IP address of the modem; if the radar is connected to an Ethernet network, this is the IP address of the gateway

8.2.1.7 Location Configuration – Firmware Upgrade

- Upload Firmware: select a radar firmware file, provided by Houston Radar, to upload to Tetryon so it can be pushed to the radar for installation
- Schedule Firmware Upgrade: select uploaded radar firmware file to install, and date and time for installation

8.2.1.8 Location Configuration – Speed Limit

- Speed Limit: user-defined value in MPH or km/h from which reported speed violator data is determined

8.2.1.9 Location Configuration – Speed Histogram

- Min Speed Bin: user-defined value in MPH or km/h to establish the lowest speed bin in Speed Histogram reporting
- Max Speed Bin: user-defined value in MPH or km/h to establish the highest speed bin in Speed Histogram reporting

8.2.1.10 Location Configuration – Tags

- Displays all the user-assigned tags for this Location; see Section 9.5 for more information on the Manage Tags feature from the Administrator Page

8.2.2 Radar Configuration

The Radar Configuration screen displays values imported from the radar. These values are not user-adjustable, and should be monitored at the direction of Houston Radar personnel.


8.2.3 Radar Configuration Audit Log

The Radar Configuration Audit Log displays the date, time, and previous value of all radar variables that have been changed. This allows you to note what changes were made, and when.

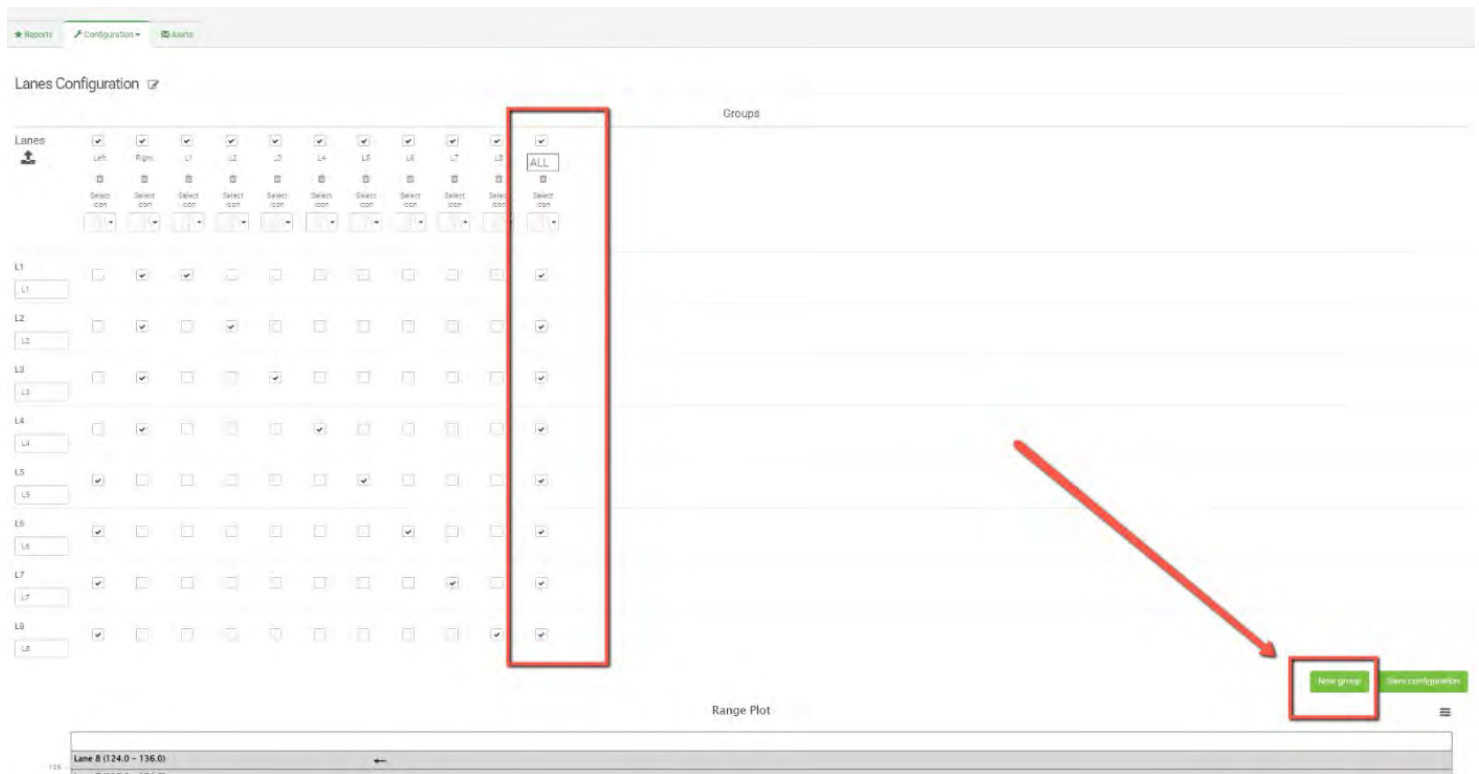
8.2.4 Lanes Configuration

The Lanes Configuration screen allows the user to name, describe, and organize directions of travel and monitored lanes. Data in reports and charts is organized by the Lane Groups defined in this screen.

Available functionality from this screen is dependent on the type of radar assigned to the Location. The SpeedLane Pro can monitor up to sixteen lanes of bidirectional traffic. Each direction and each lane can be named or described. The SpeedLane Pro's defined lanes and Range Plot are imported from the radar. The Armadillo Tracker organizes data by direction of travel instead of individual lanes, and it does not have a Range Plot.

To edit values or add Lane Groups in Lanes Configuration, select the Edit icon  towards the top of the screen.

To add a new Lane Group, click on New Group in the lower right corner of the screen. By default, all the defined lanes imported from the radar will be assigned to this new Lane Group. You can select and deselect any of the available lanes for your new Lane Group.



The user can customize the name of each Lane Group, the Lane Group's icon, and can name or describe each defined lane:

The screenshot displays the 'Lanes Configuration' interface. At the top, there are tabs for 'Reports', 'Configuration', and 'Alerts'. The main area is titled 'Lanes Configuration' and features a 'Groups' section with a grid of lane groups (L1-L8) and lanes (Left, East, L1-L8). Each lane group has a name field, an icon selection dropdown, and a 'Select icon' button. A red arrow points to the 'East' icon selection dropdown for the L1 group. Below the grid, a 'Range Plot' section shows two lanes: Lane 6 (124.0 - 136.0) and Lane 7 (112.0 - 124.0). Several elements are highlighted with red boxes: the 'Lanes Configuration' title, the 'East' icon dropdown, the L1 group name field (containing 'WB Shoulder'), the L4 group name field (containing 'WB Fast Lane'), the L5 group name field (containing 'WB Fast Lane'), and the L8 group name field (containing 'WB Shoulder').


Group	Left	East	L1	L2	L3	L4	L5	L6	L7	L8
L1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L3	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
L7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
L8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

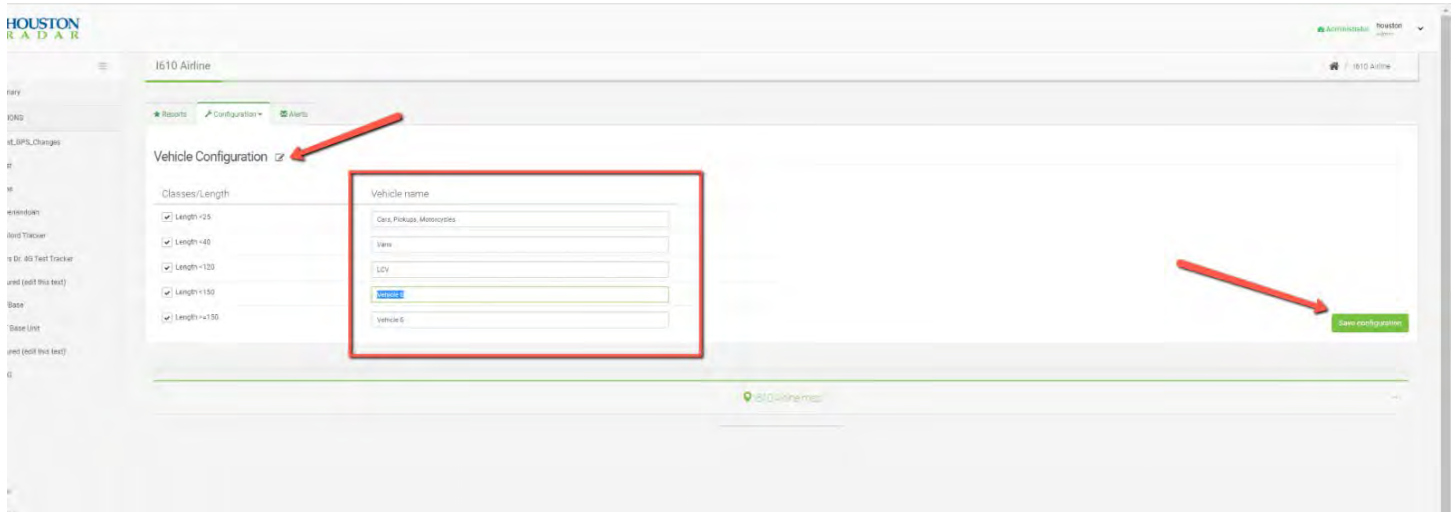
Range Plot

Lane 6 (124.0 - 136.0)	←
Lane 7 (112.0 - 124.0)	←

8.2.5 Vehicle Configuration

The Vehicle Configuration screen gives the user the ability to name the size classes imported from the radar. While the SpeedLane Pro provides up to eight user-defined size classes, Tetryon will only display the size classes that are defined on the radar. The Armadillo Tracker provides three factory-set size classes, and all three classes will be listed on this screen.

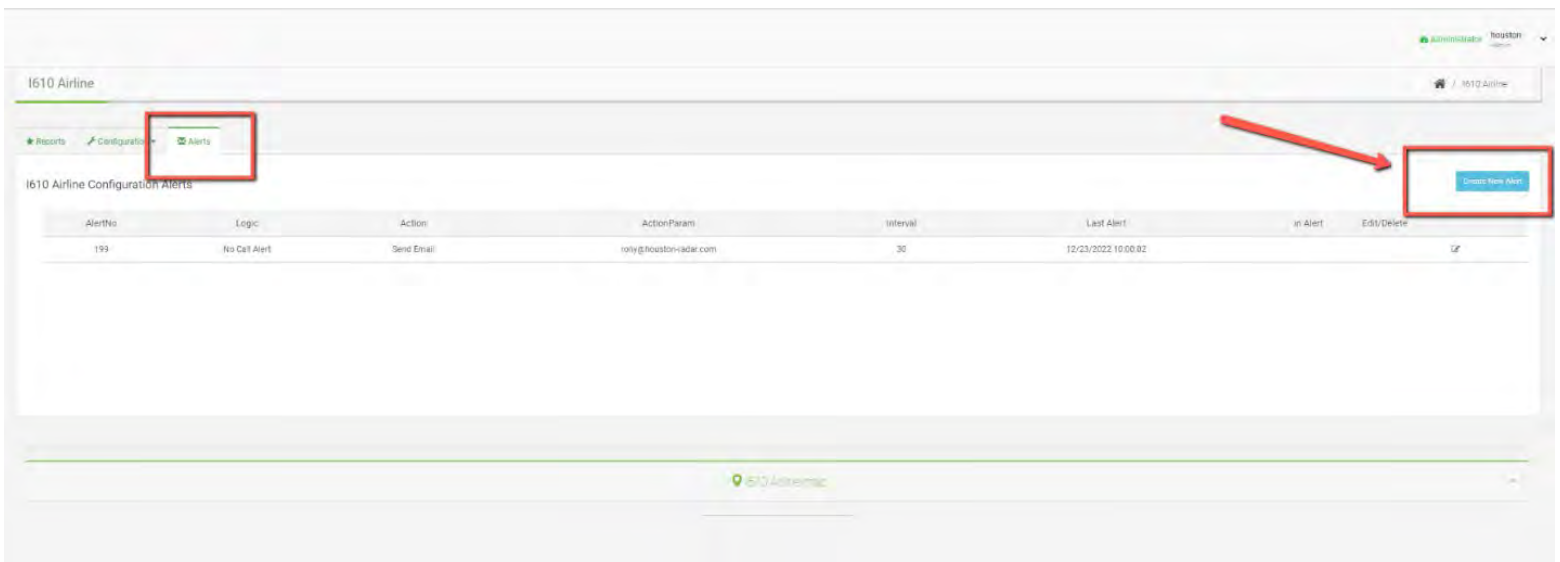
To edit the size class names, click on the Edit icon  near the top of the screen, and then enter new values in the available fields under Vehicle Name:



8.3 Alerts Tab

Tetryon's Location Alerts provide email and/or image alerts when certain traffic or radar conditions are met for a specific Location. Each Location can have an unlimited number of Alerts, and can be logical combinations of different speed, count, occupancy values, or radar-related values such as battery voltage and temperature.

To create a new Alert, first select the Create New Alert button on the right side of this screen.



Then, complete the user-definable fields in the resulting window.

Speedlane Alert for I610 Airline

LocationNo: 15 AlertNo: 200 Minimum time between alerts (min): 5

IF

Speed <= 40 then

Send Email

Email address(es): casey@houston-radar.com

Email subject: casey@houston-radar.com

Submit Debug

Emailed alerts can include an animated gif of traffic and lane-by-lane statistics.

9.0 ADMINISTRATOR PAGE

Tetryon's Administrator page is accessible from the Home Page by users with permission levels of Level 2 Supervisor and Level 1 Site Admin. The Administrator page allows these users to edit account settings, add/edit users, edit certain Location information, manage Tokens (see Section 11 for more information on Tokens used with Tetryon's Rendezvous feature), and manage Location Tags.

9.1 Dashboard

The Dashboard displays a list of all Locations and users assigned to your account. The View links for each entry takes the user to the Locations or Users menus.

9.2 Users

The Users menu displays a list of all users assigned to your account. You can create new users, delete users, or edit user profiles from this screen.

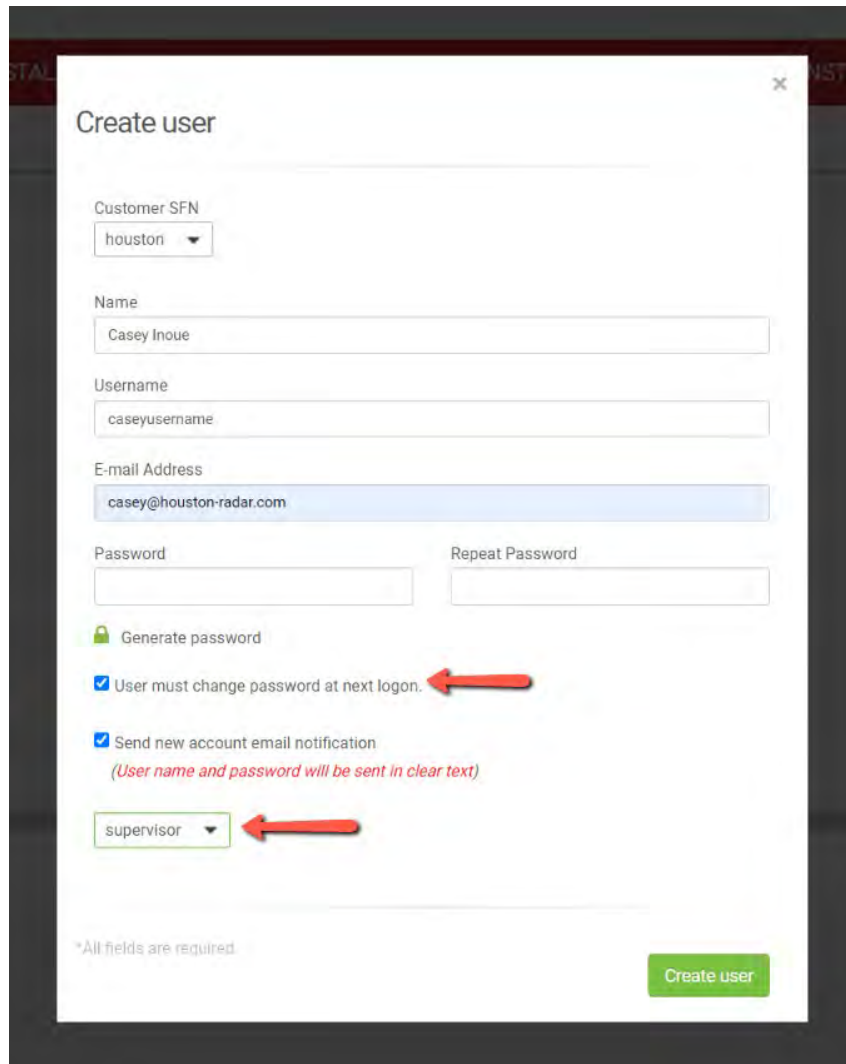
The screenshot shows the 'Users' management interface. The navigation menu on the left includes 'Dashboard', 'Settings', 'Customers', 'Users', 'Locations', 'Manage Tokens', 'Manage Tags', 'Permission Levels', and 'Manage Road Icons'. The 'Users' menu item is highlighted with a red box and an arrow. The main content area features a search bar and a 'Create New User' button. Below these is a table with the following data:

UserID	Username	Name	Email	Status	Role	Customer	Updated	Action
1	houston	Rony Thomas	rony@houston-radar.com	✓	Admin	houston	07/02/2019 15:16	[View]
2	stafford	Rony Thomas	rony@houston-radar.com	✓	Supervisor	Stafford	07/02/2019 15:53	[View]
3	rony	rony	rony@houston-radar.com	✓	User	houston	07/08/2019 10:13	[View] [Edit]
4	travancore	Travancore Analytics	digits.v@travanta.in	✓	Supervisor	houston	07/15/2019 11:18	[View] [Edit]
5	BGE	Rony Thomas	rony@houston-radar.com	✓	Supervisor	BGE	06/16/2020 11:02	[View]
6	BGE1	RT	rony@houston-radar.com	✓	Supervisor	BGE1	05/14/2020 11:07	[View]
7	JTB	rony t	thomasrony@gmail.com	✓	User	houston	07/21/2020 12:27	[View] [Edit]
8	casey	Casey	casey@houston-radar.com	✓	Supervisor	houston	03/08/2021 10:25	[View] [Edit]
9	user_stafford	User For Stafford	rony@houston-radar.com	✓	Guest	Stafford	03/26/2021 13:56	[View] [Edit]
10	sup_stafford	Supervisor For Stafford	rony@houston-radar.com	✓	Guest	stafford	08/26/2021 13:56	[View] [Edit]

Showing 1 to 10 of 14 entries

9.2.1 Creating Users

When creating a new user profile, a password must be assigned. As a security measure, the Supervisor creating the user profile can select the option “User must change password at next logon” so that the new user can create a unique, unshared password. A User Permission Level must also be assigned to the new user.



The screenshot shows a 'Create user' form with the following fields and options:

- Customer SFN: houston
- Name: Casey Inoue
- Username: caseyusername
- E-mail Address: casey@houston-radar.com
- Password: (empty)
- Repeat Password: (empty)
- Generate password
- User must change password at next logon. (indicated by a red arrow)
- Send new account email notification
(User name and password will be sent in clear text)
- supervisor (indicated by a red arrow)

*All fields are required

Create user

9.2.2 User Permission Levels

Level 4 - Guest

Allowed:

- View anything on their own customer view
- Change password while logged in
- View current speed settings on summary page
- View reports
- View road names
- View lane names and settings
- View vehicle class names

Not Allowed:

- Edit Location and Radar Configurations
- Edit GPS for Locations (Maps)
- Edit saved reports
- Access Administrator pages

Level 3 - User

Allowed:

- Access/View anything on their own customer view
- Change password while logged in
- Create/Edit/Delete Alerts on their own customer view
- Create/Edit current speed settings on Summary page
- Create and save reports
- Change road names
- Change lane names and settings
- Change vehicle class names

Not Allowed:

- Edit Location and Radar Configurations
- Edit GPS for Locations (Maps)
- Access Administrator pages

Level 2 - Supervisor

Allowed:

- Create new users for their own customer ID (only)
- Edit own settings / Users / Locations / Radar Configurations / Locations Configurations
- Edit GPS for own Locations
- Delete own settings / Users / Locations / Radar Configurations / Location Configurations
- Assign/Re-assign Level 2 Permission (Supervisor) for own Users
- Access/View anything on his own customer view

Not Allowed:

- Create new users for other customers
- Assign/Re-assign Level Permission 1 (Site Admin) for any users

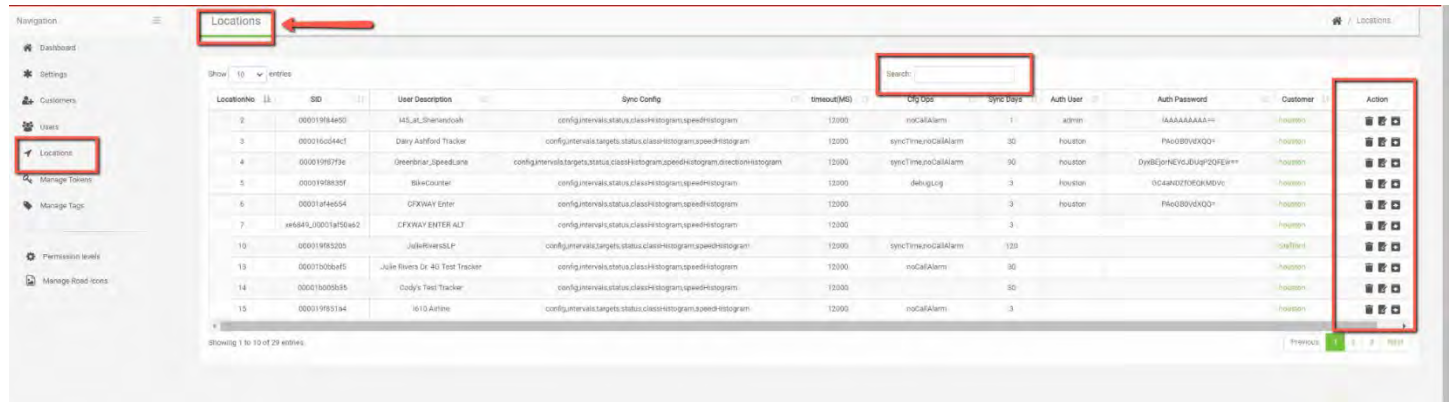
*Level 1 - Site Admin

Allowed:

- Create anything/anywhere
- Edit anything/anywhere
- Delete anything/anywhere
- Assign/Re-assign any User Level Permissions
- Access/View anything/anywhere
- *Only available for self-hosted Tetryon Server users*

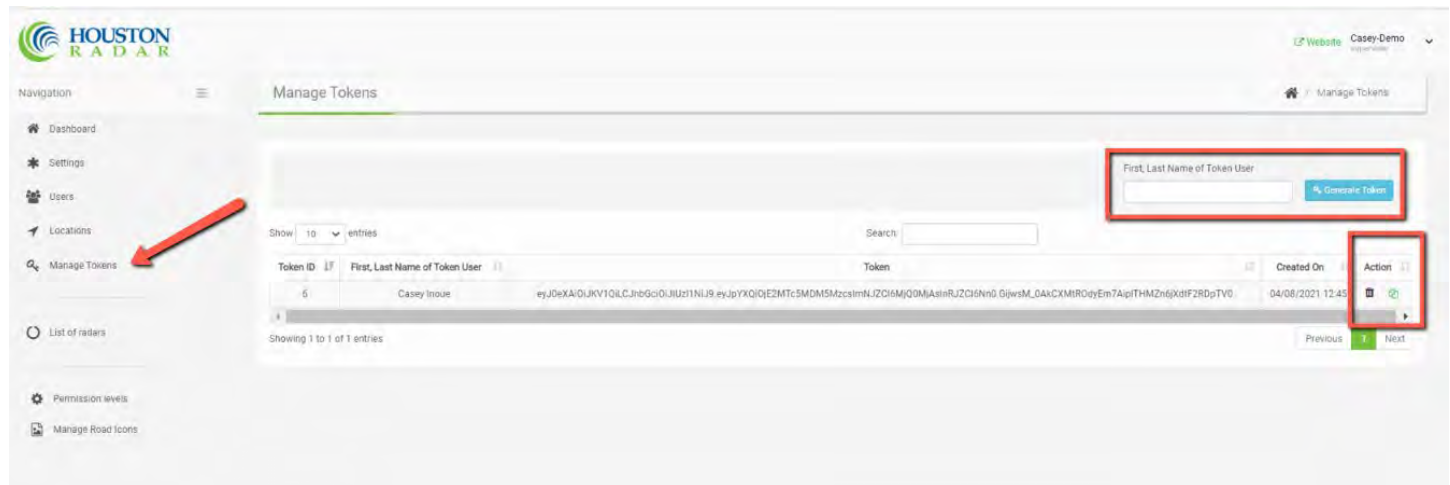
9.3 Locations

The Locations menu displays a list of all Locations assigned to your account. You can Archive, Delete, and Edit Locations from this screen. See Section 8.2.1 for more information on Location Configuration settings.



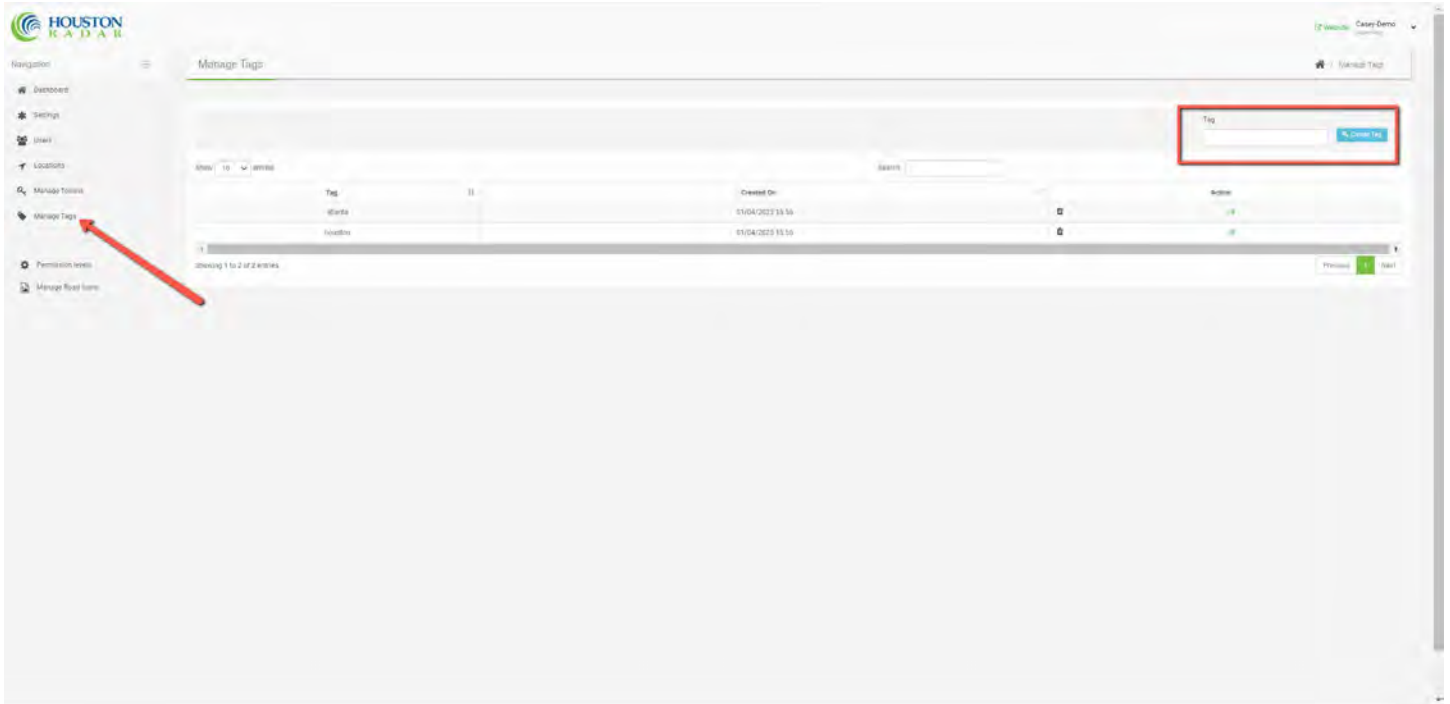
9.4 Manage Tokens

The Manage Tokens menu allows the user to create and delete Tokens used for Tetryon’s Rendezvous feature. Please see Section 11 for more information on Tetryon’s Rendezvous feature.



9.5 Manage Tags

The Manage Tags menu allows the user to create Tags that can be assigned to individual Locations. Assigning a Tag provides another method of searching and grouping Locations from the Summary Pane.



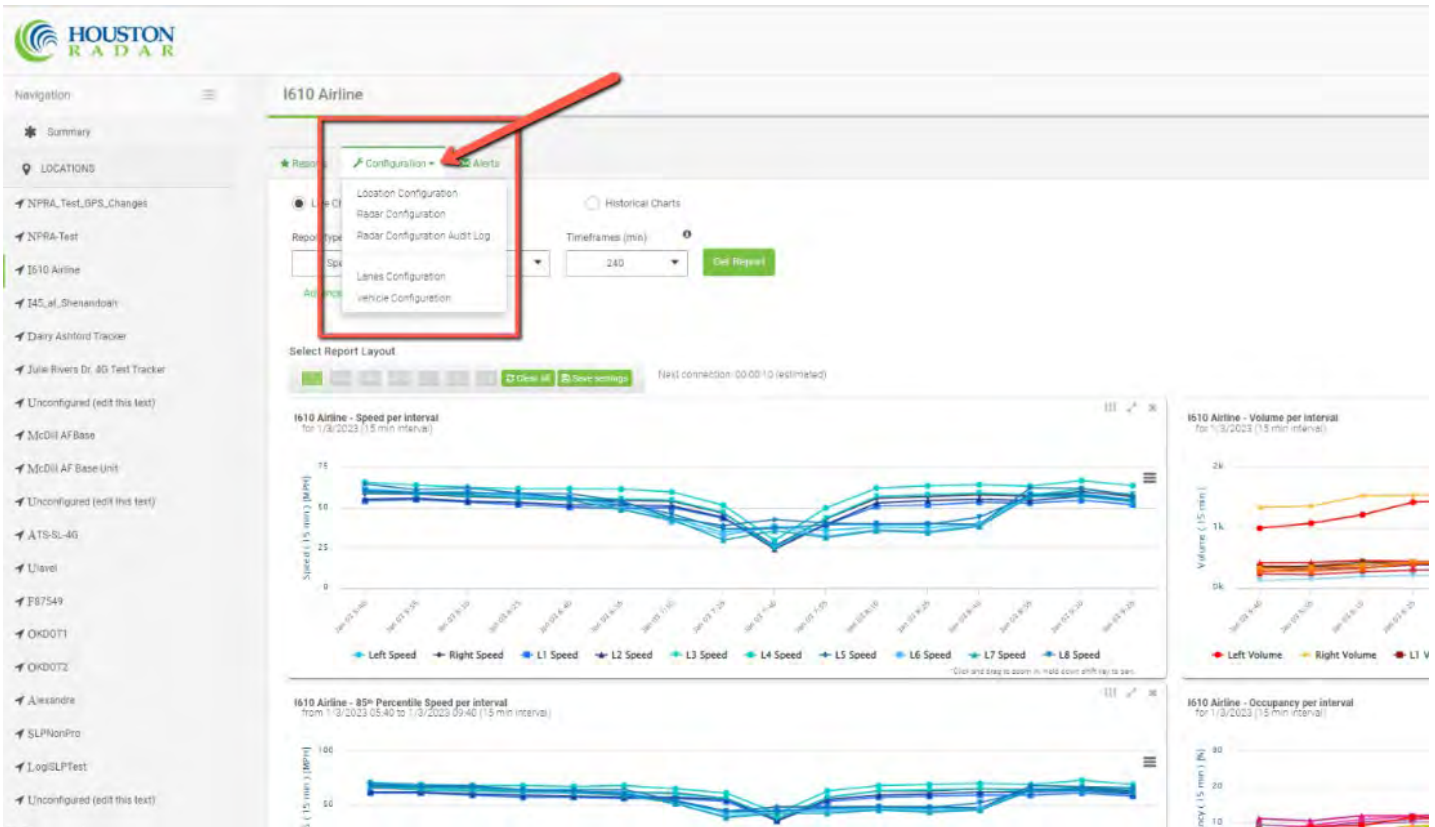
10.0 ACCOUNT MAINTENANCE

Tetryon does not require any user-directed maintenance to operate properly. However, over the course of time it may become helpful to take advantage of built-in features that can enhance the user experience.

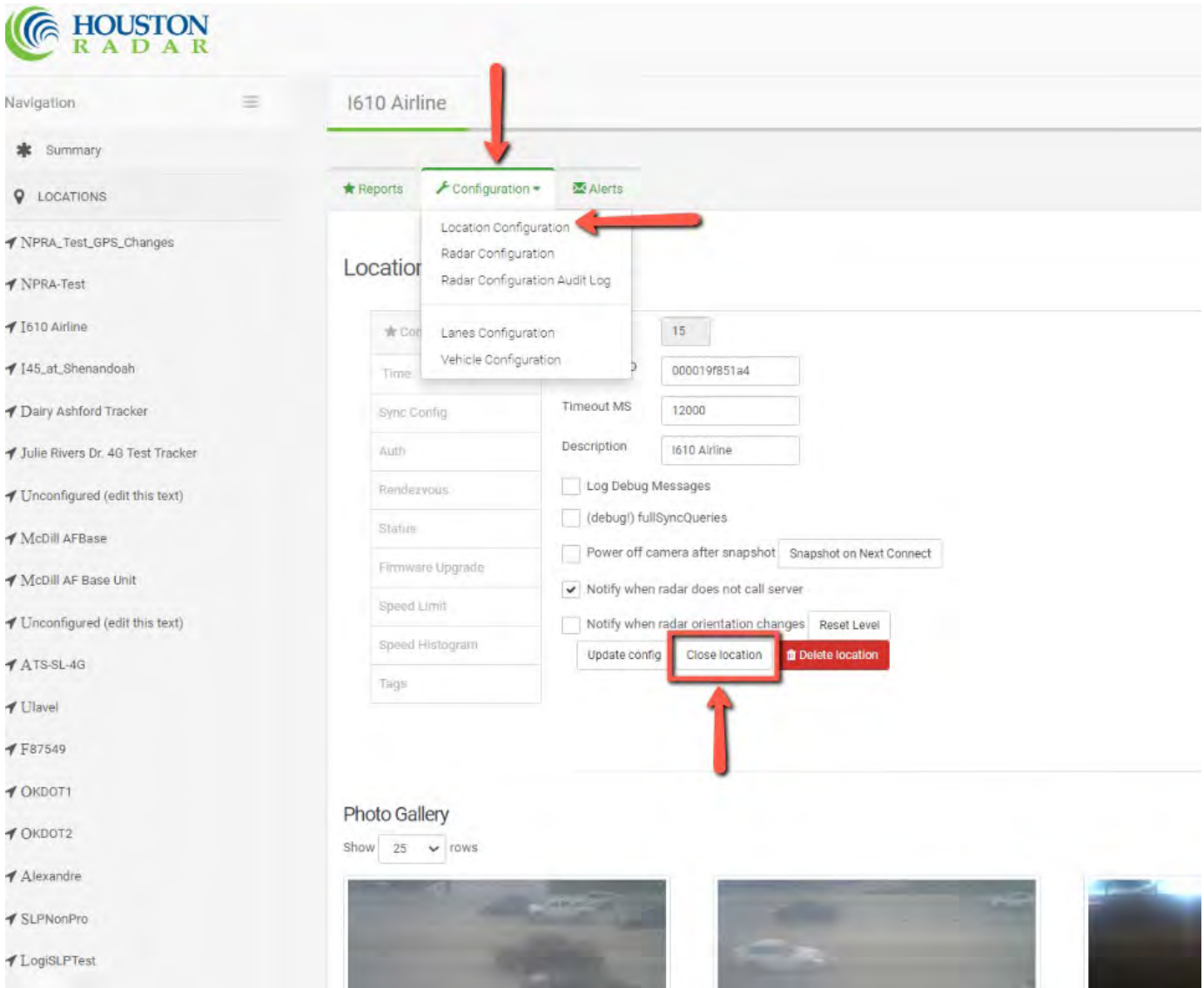
10.1 Close Location

When a radar Location in Tetryon has its physical radar removed or replaced, the Location entry in Tetryon should be Closed. Closing the Location prevents any new data from being added to that Location. The Closed Location will still be displayed in both the Navigation pane, and the Summary list, and its data from before the Close action will still be accessible.

1. From the Summary Tab or Navigation Pane, click on the desired Location's name to open the Location view.
2. Click on the Configuration tab, then select Location Configuration.

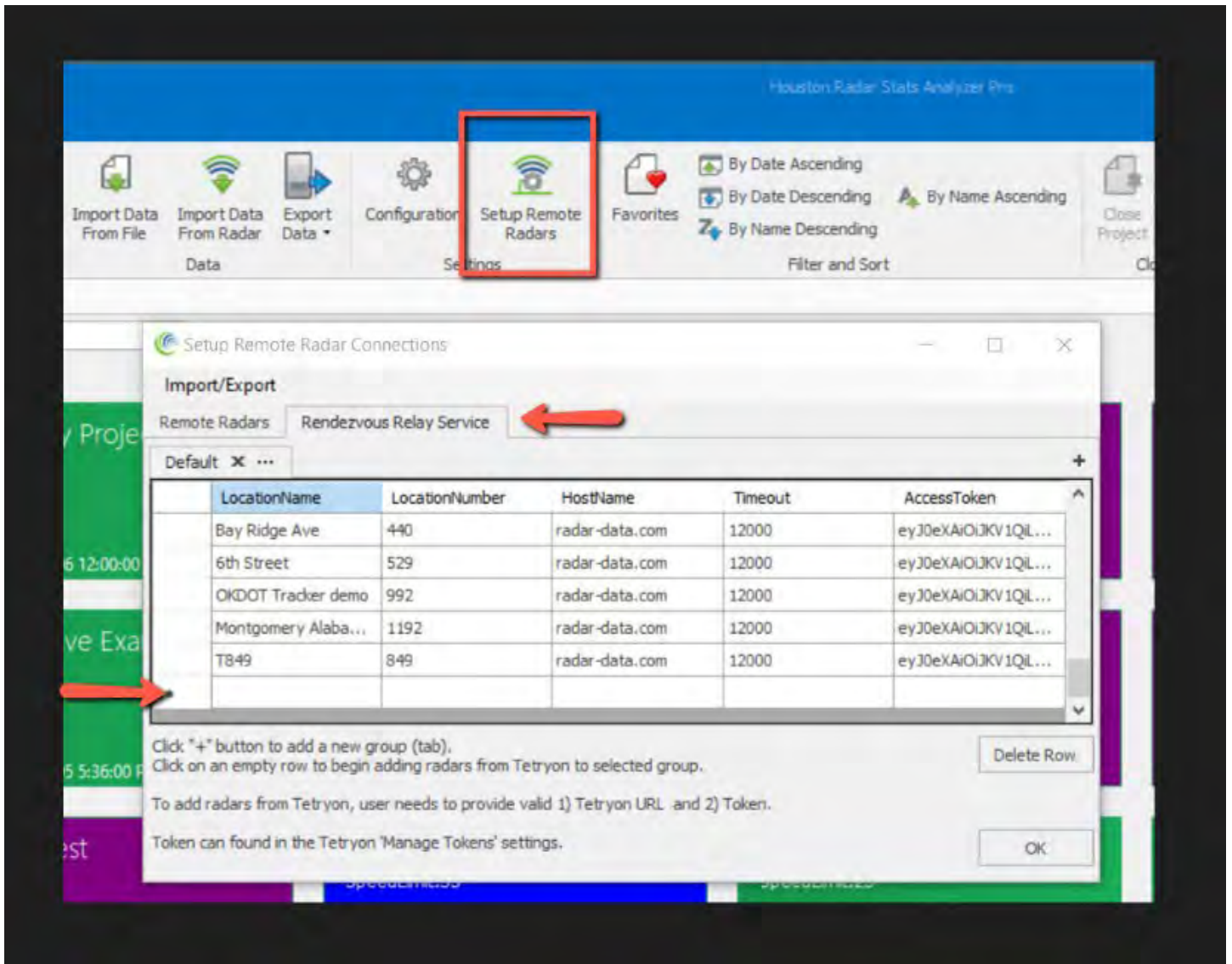


3. At the bottom of the Location Configuration screen, select Close Location.

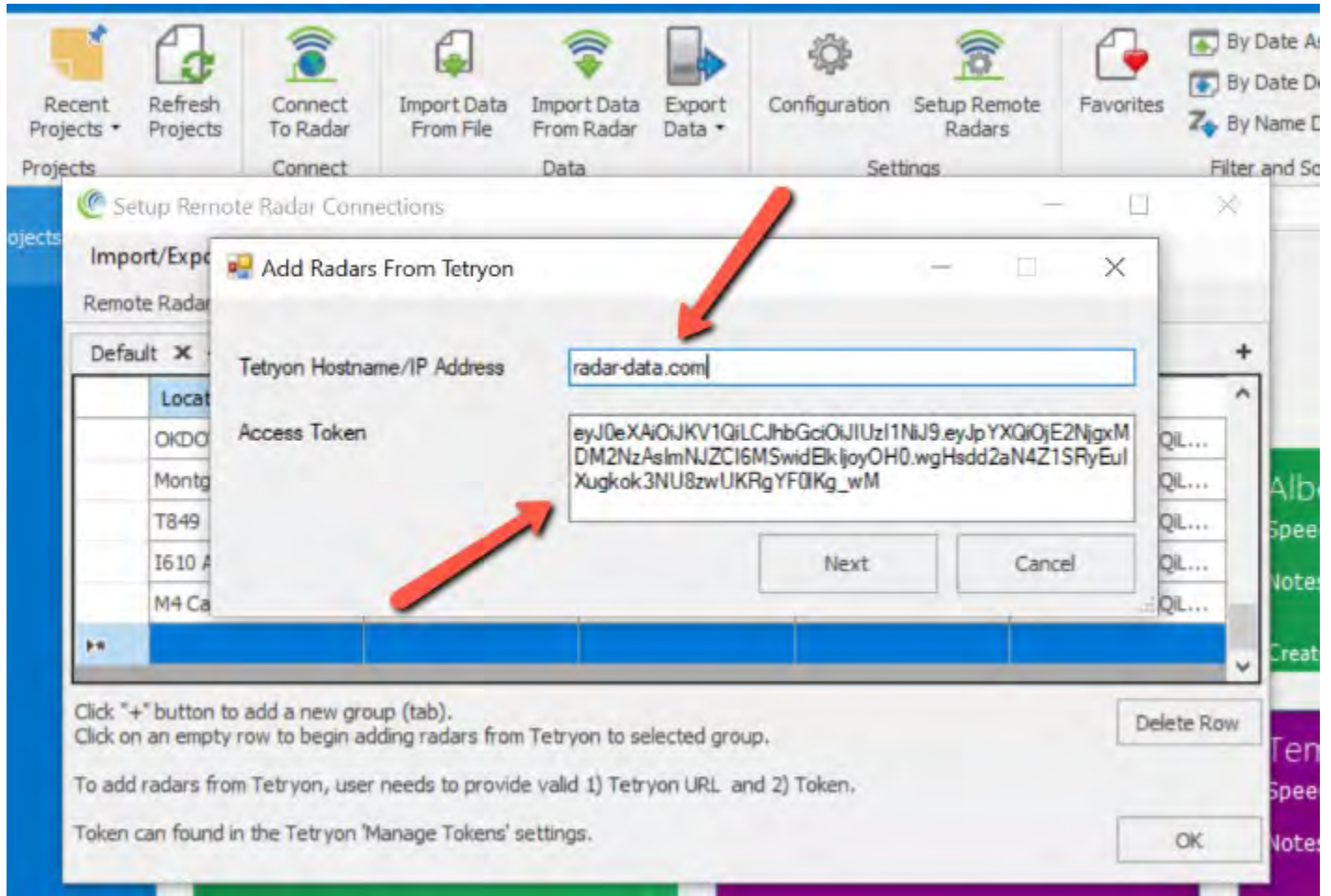


4. If the Location's physical radar is replaced, follow the instructions for configuring a new radar Location once the replacement radar contacts Tetryon (see Section 5.0). Choosing to replace a Location when configuring a new Location will automatically Archive the replaced (old) Location.

Open the StatsAnalyzer software and select Setup Remote Radars> Rendezvous Relay Service:



Click in the first column of the next available blank row, then enter “radar-data.com” in the Tetryon Hostname/IP Address field, paste the Token in the Access Token field, and click Next:



A new window will display all the Locations from your Tetryon account. Select any or all the available Locations. The selected Locations will be added to StatsAnalyzer’s “Connect To” drop-down menu.

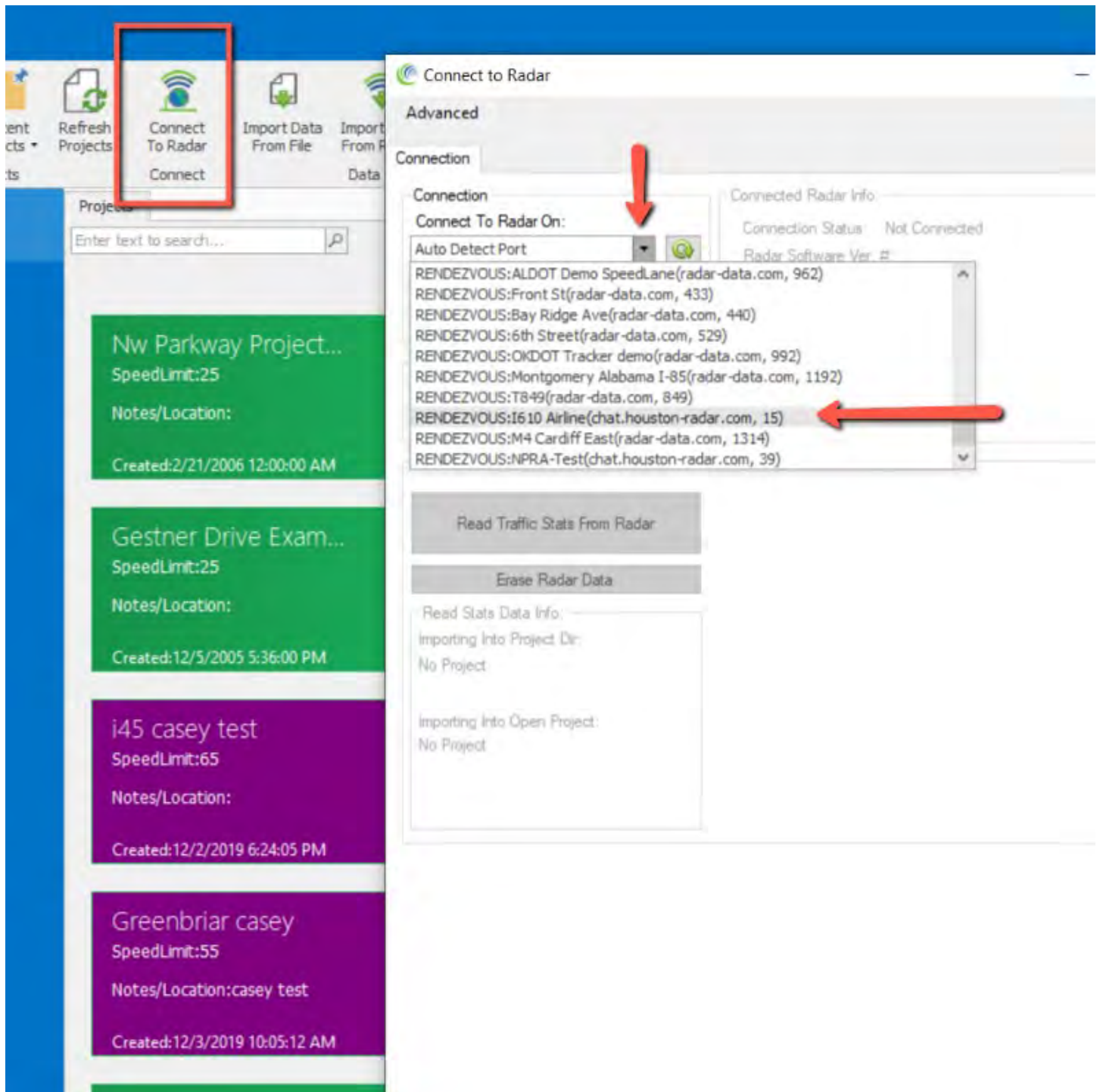
11.2 Connect to a Radar using Rendezvous

Within Tetryon, you will need to prepare the Location with which you want to Rendezvous. Navigate to the specific Location and select Configuration> Location Configuration> Rendezvous, check the box for “Rendezvous with radar on next connect”, and click Update Config:

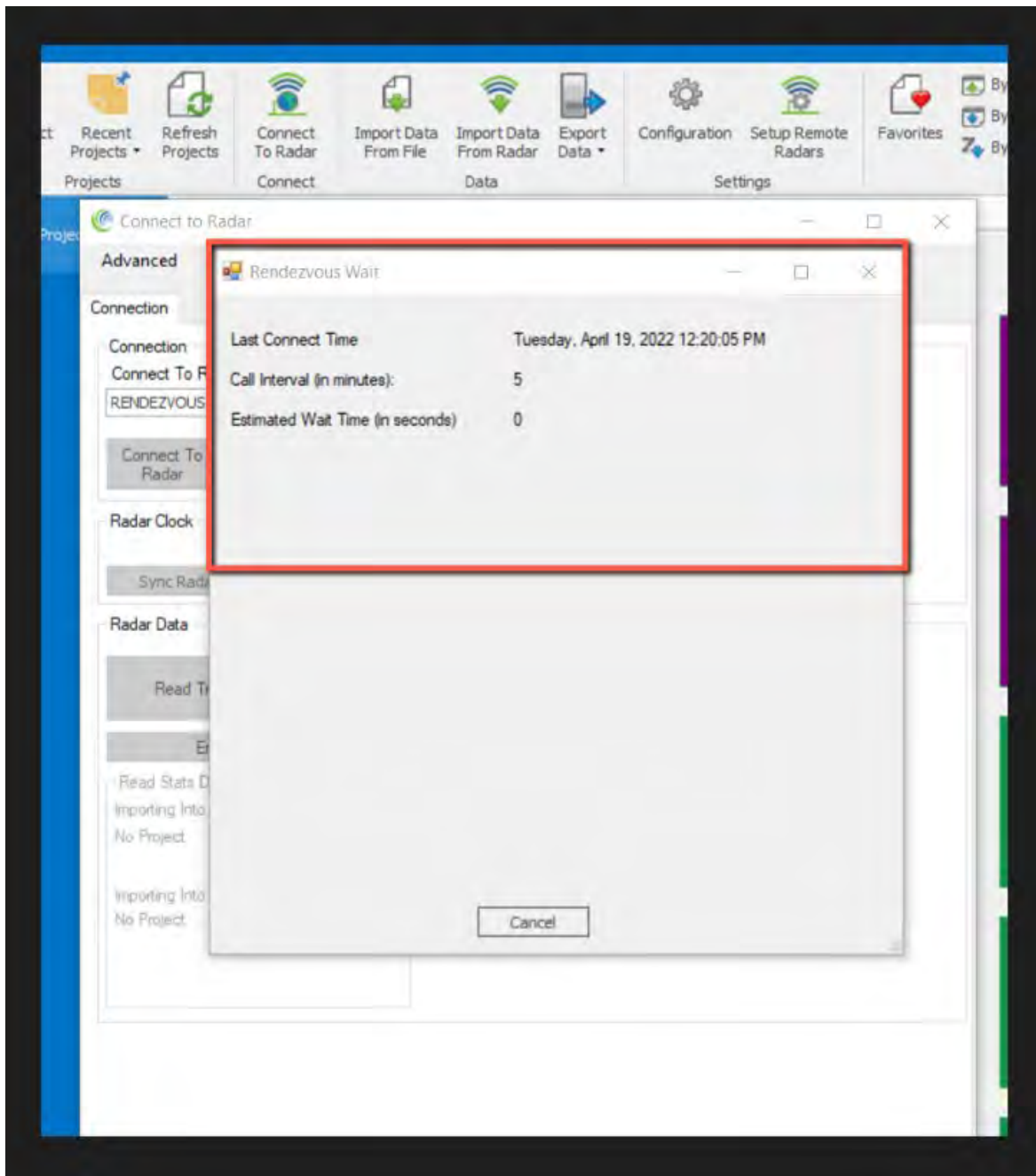
The screenshot displays the Tetryon web interface for the 'I610 Airline' location. The left sidebar shows a navigation menu with 'LOCATIONS' expanded, listing various locations including 'I610 Airline'. The main content area is titled 'Location Configuration' and features a 'Rendezvous' tab, which is highlighted with a red box. Below this tab, there is a checkbox labeled 'Rendezvous with radar on next connect', which is currently unchecked. A red arrow points to this checkbox. Below the checkbox, there are three buttons: 'Update config', 'Close location', and 'Delete location'. Another red arrow points to the 'Update config' button. The interface also includes a 'Photo Gallery' section at the bottom, showing a grid of images.

When the radar next calls into Tetryon, Tetryon will hold the connection and open a port for you to connect to. You will be connecting to this port in Tetryon, not the radar itself.

From StatsAnalyzer, open the Connect To Radar menu, and select the appropriate Location from the “Connect To Radar On” drop-down menu:



StatsAnalyzer will open a new window with an estimated countdown timer until the Rendezvous connection is made:



Tetryon will then connect the two sockets behind the scenes, and you will have near-full access to the radar as found with a traditional cellular connection from StatsAnalyzer. The only functionality not yet available is the SpeedLane Pro video streaming. You can still take snapshots, as well as perform any other configuration changes that you otherwise could if you were connected directly.

Here is a brief video demonstrating Rendezvous: <https://youtu.be/KopKhBzqQEO>

You will need to configure a Location for a Rendezvous connection from the Location Configuration> Rendezvous screen each time you wish to connect using Rendezvous.

11.3 Rendezvous for self-hosted Tetryon Server on a VPN

To use Rendezvous if you host your own Tetryon Server and use a VPN, please note:

1. Open TCP Port 35100 in your server's firewall.
2. Confirm a valid API Token for your server.
3. Your Tetryon Server must be reachable through HTTP (TCP Port 80) from the computer that is used for StatsAnalyzer

12.0 CONTACT US

For Sales inquiries, please contact your local Houston Radar distributor or sales partner. To be directed to the appropriate local entity, please contact Houston Radar at sales@houston-radar.com or +1.888.602.3111 extension 1.

For Service and Support, please contact the Houston Radar Service Department at support@houston-radar.com or +1.888.602.3111 extension 2.