QAM Snare Manager User Manual

QS-MUM-3.4

1/2/14

This document details the functions and operation of the QAM Snare Manager software package

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Overview

QAM Snare technology detects digital leaks by performing a correlation process on a selected QAM channel. The correlation compares samples of the QAM channel from the cable network, with samples pulled off the air at the same frequency using an antenna. If there is correlation between the two signals, this indicates that the leakage detected off-air is the same signal as was carried on the network, and that it is with certainty a leak from the cable network.

For QAM Snare Monitor and Navigator, the samples of the QAM channel used for correlation originate at the headend, and are transmitted to the field unit via an IP connection. The QAM Snare Monitor and Navigator continuously correlate the signal set originating at the headend and the signal set pulled off of its local antenna, and when leakage is detected a database at the headend is updated with the relevant information and leak characteristics.

Simultaneous to the leakage detection, QAM Snare also tunes to LTE downlink and public safety frequencies and measures the LTE signal level at each detection point. This allows for intelligent prioritization of leak repair such that those leaks that likely will be most troublesome can be addressed first. This feature provides a huge benefit in the overall operating costs associates with leak mitigation.

QAM Snare Monitor is intended as a black box solution that continually performs leak detection without any driver or user involvement. It is intended to identify leaks and then store the leak data in the headend database, for future repair assignment.

QAM Snare Monitor can also be used for as a tool to identify and repair leaks if used in conjunction with some other tools. A companion piece, the QAM Snare Isolator, is a hand held unit designed for the last few feet device identification. It can be carried by the technician and brought up in the bucket in order to identify the exact device or connector that is the source of the leak. The QAM Snare Isolator operates in exactly the same fashion, but it receives the QAM channel samples in a different method. When QAM Snare Isolator pairs with Monitor, the Monitor changes its operational mode and functions as a data bridge such that samples from the headend are relayed to the Isolator. The Isolator then correlates the headend signal set with the signal set pulled from its local antenna. The wireless 900 MHz ISM band is used for communication between paired devices.

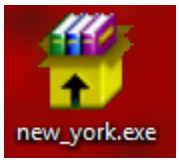
QAM Snare Navigator is intended as a tool for the user that is charged with actually fixing the leaks. As such it allows for the user to select the operating channel and the FSK frequency used to connect with Isolator as described above. It additionally has a display where leak characteristics, detected LTE signal level, and a map showing leak location can be viewed. It can automatically receive work orders, and it has the ability to close leaks directly from the device.

Additionally, the QAM Snare Web Client, run from a web browser on either a PC or a mobile device, can display work orders and display the leak location on a Google map such that the user can get to the offending location, perform the repair, and close out the work order.

Software installation

Install the current version of the QAM Snare Manager executable program downloaded from the Arcom FTP or web site www.arcomlabs.com.

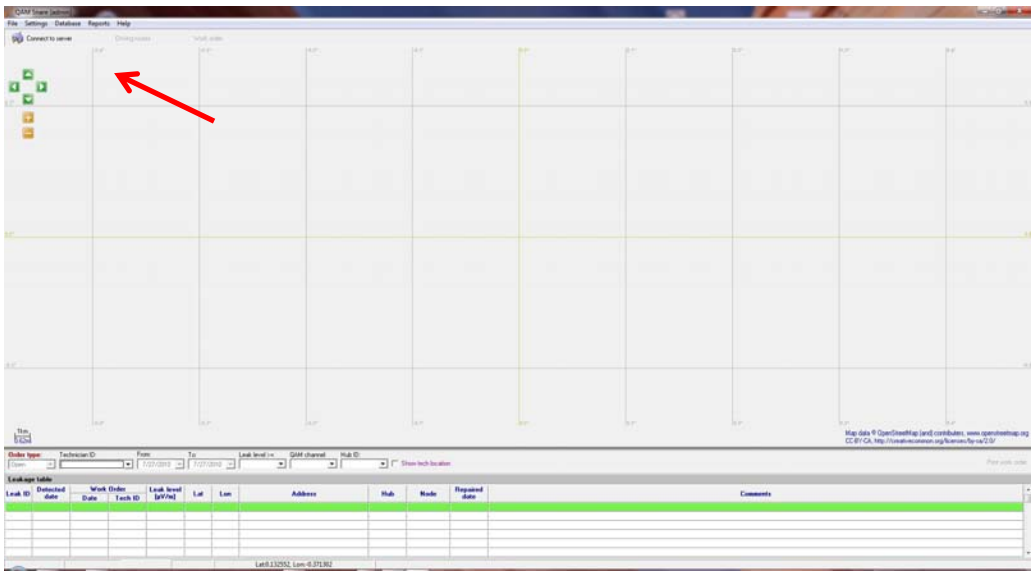
Then install the executable map file for the desired state/location. Files are copied to the appropriate direction and no further user interaction is required.



To start the QAM Snare Admin, click the QAM Snare Admin icon.

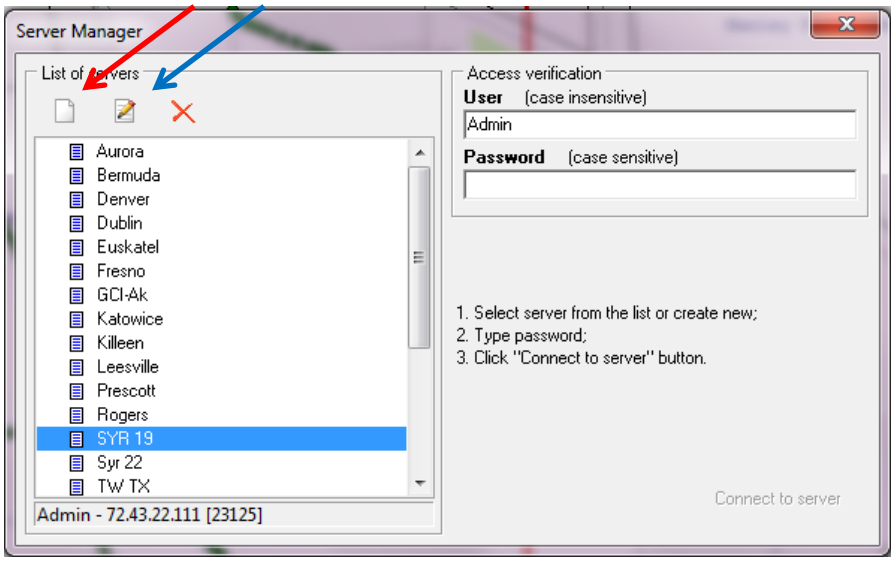
Startup

First, press the Connect to Server button.

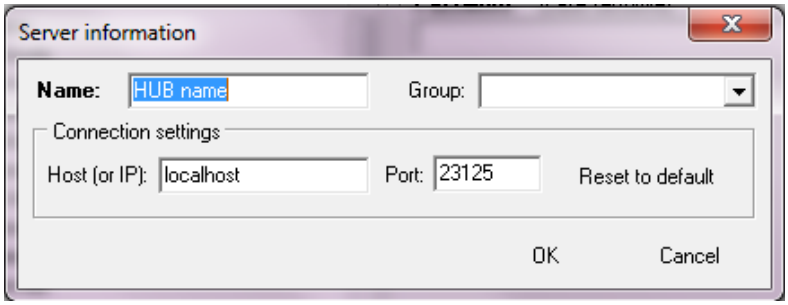


The Server Manager appears. If Server is already loaded simply press the desired hub, in the case below syr 22 and enter password, or for a new Server press the new Server button indicated by the red arrow below. To edit an existing Server, press the

edit button indicated by the blue arrow below. To delete a Server press the red X delete button.



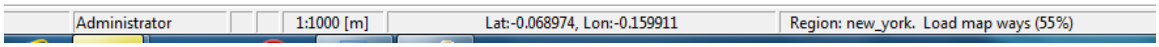
As shown below, enter the Server name and IP address in the box where localhost is currently written. If a cloud server is being utilized, enter the complete server Dynamic DNS domain name.



Press ok, then highlight the selected Server and enter sign in credentials.

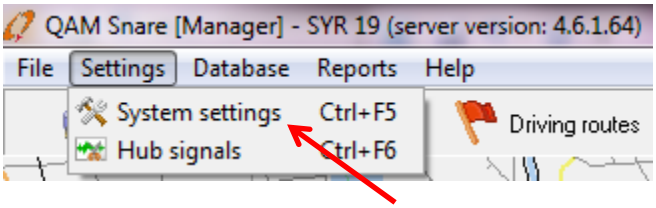
The program will start by loading the installed state maps. This will take a few moments depending upon the speed of the PC. The software may be used during this initial map loading period.

Each time you enter the program, as the map is loading it will show a progress bar at the bottom of the screen. The map for each state contains overlaps onto adjacent states, so regions close to a border are not a problem.



Settings – System Settings

The System setting menu item controls all aspects of how the system is configured, how alarms are generated, and establishes which QAM channel and FSK various connected devices operate on. To access System setting, click on the menu item.

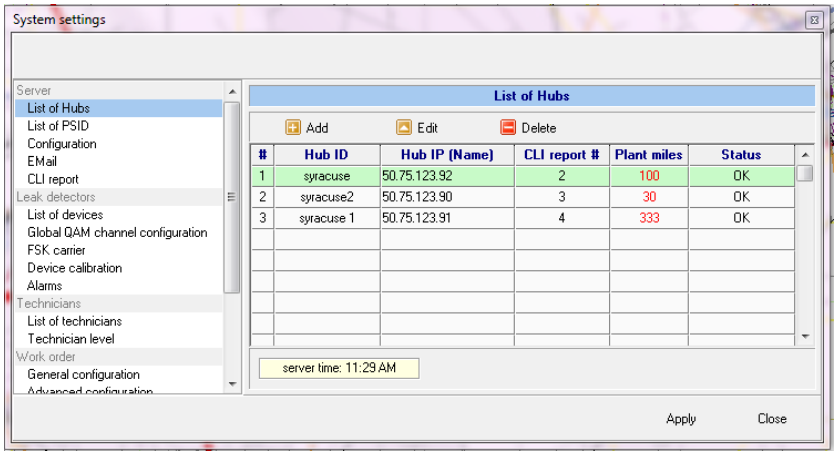


There are several major categories within System settings: Server, Leak detectors, Technician, Work order, and Admin.

Server

List of Hubs

QAM Snare is designed to operate in multi-hub environments, where devices installed in vehicles roam freely between hub boundaries. The GPS hub boundaries are loaded into the headend servers such that each device always receives samples from the correct headend, ensuring proper leak detection. The list of Hubs provide information as to the connected hubs. If there is only one hub it is listed as a Local hub as shown below. When properly communicating, Status should be displayed as OK.



Press the Add button to add a new hub to connect with the Server.

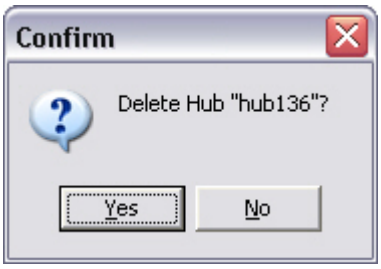
Then enter the Hub name, Hub IP (or Dynamic DNS), and CLI report number and number of Plant miles.

Press the Edit button to edit information about an existing hub.

Enter the updated information and press OK.

To delete an existing hub press the Delete button.

And confirm the action by answering yes when prompted.

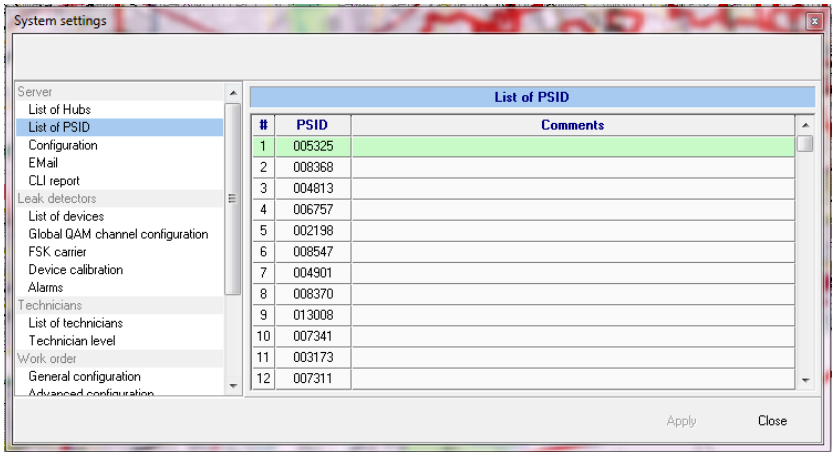


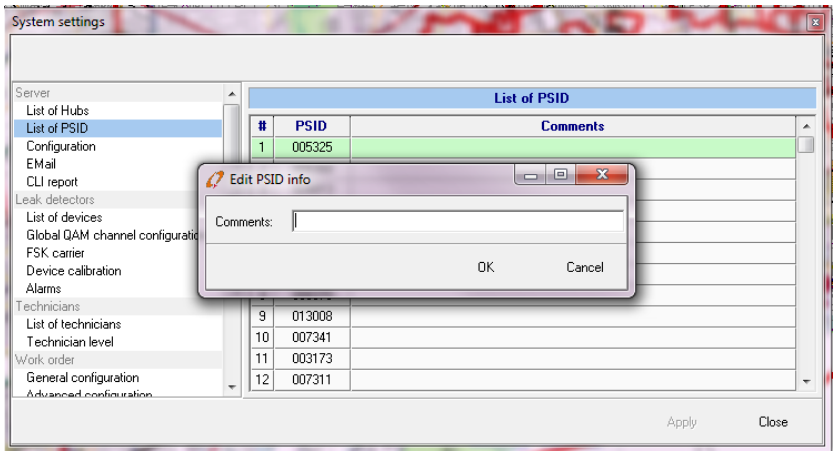
List of PSID

QAM Snare has the ability to display Physical System Identification (PSID) boundaries. The list of PSID shows all numbers associated with the server.

The PSID boundaries are entered by Arcom Digital as an administrative function based upon information provided by the system.

If desired, comments regarding each PSID can be added to each line item by clicking on the highlighted line.

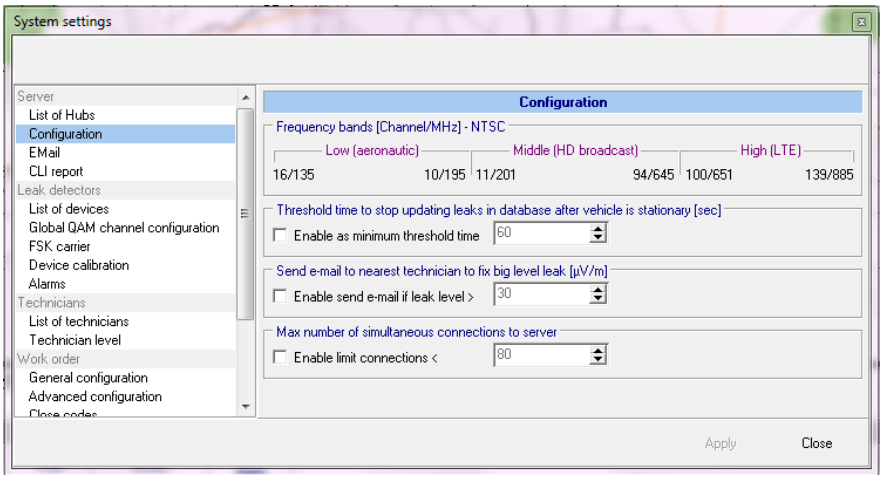




Configuration

QAM Snare is designed to allow for field unit to collect leak data within multiple frequency bands – and to provide summary reports on leakage at various frequencies within these bands. The frequency bands are low (aeronautic), middle (HD broadcast), and high (LTE) – for consistency between various reports and other system output,

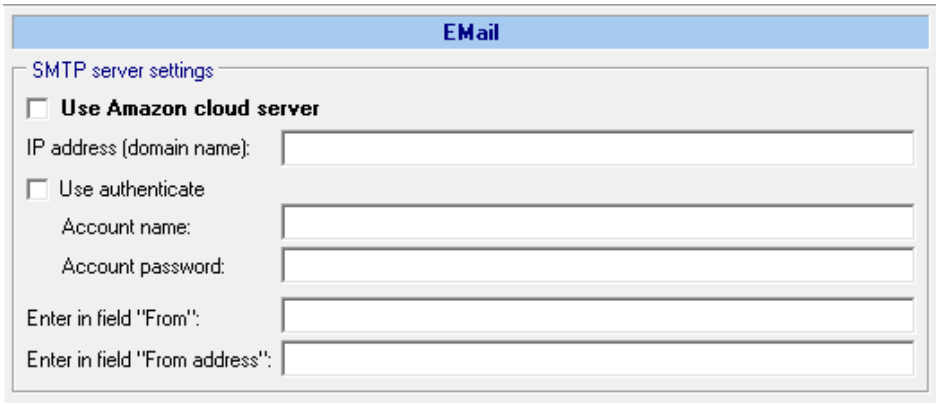
these frequency bands are fixed and can't be changed by a user. The lower frequency limit of QAM Snare is fixed at channel 16, and the upper frequency is 195MHz. Middle band starts at 201MHz and ends at 645MHz. And the high LTE band starts at 651MHz and ends at 885MHz.



Within the configuration settings, options are provided to not update detected leaks to the database after the vehicle has been stationary for a certain period of time. This is for scenarios where there is not leak at a location and a technician goes to fix something else. This prevents a leak from being recorded when the technician performs an action such as opening an amplifier. The time setting provides a way to change the amount of time after which no leak has been recorded, that the database is locked from being updated. This menu item also allows for enabling email notification to be automatically sent to the technician nearest a large leak. The last menu item provides a method to limit the number of simultaneous users connecting with QAM Snare Manger to the Server.

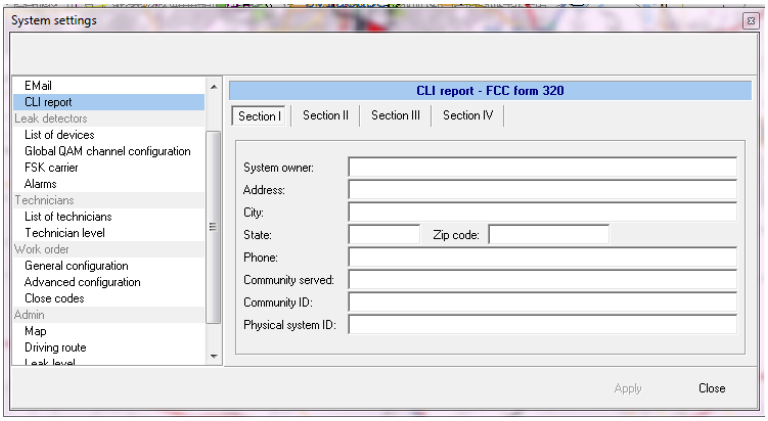
Email

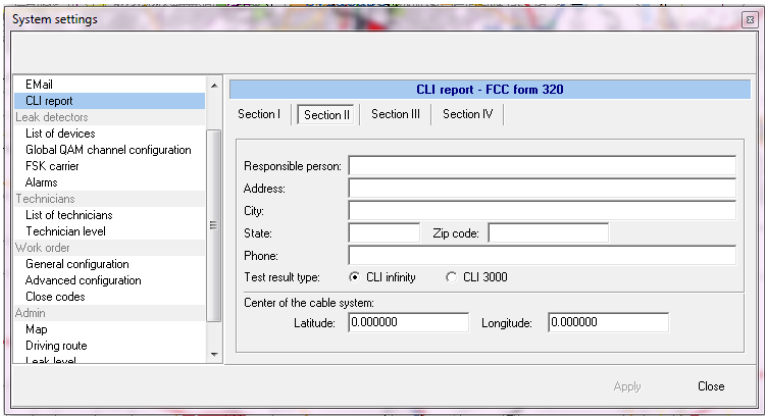
SMTP alarms can be configured under the Email menu item. Information on your SMTP server that is used to forward the alarms is entered here. This information should be able to be supplied by your IT department. Select the Use Amazon cloud server option for SMTP if you want to use a hosted SMTP service.

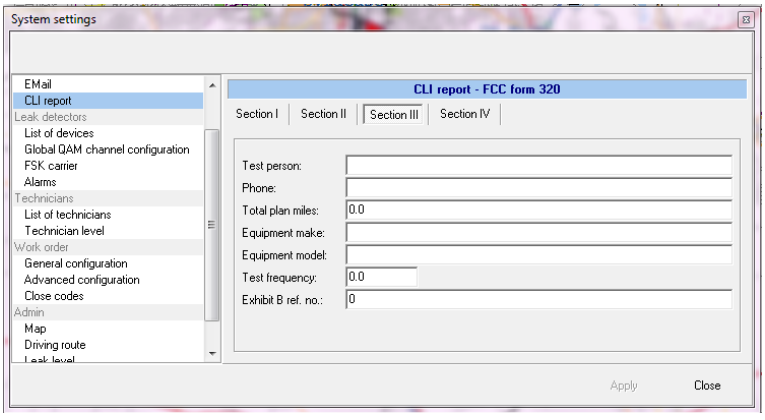


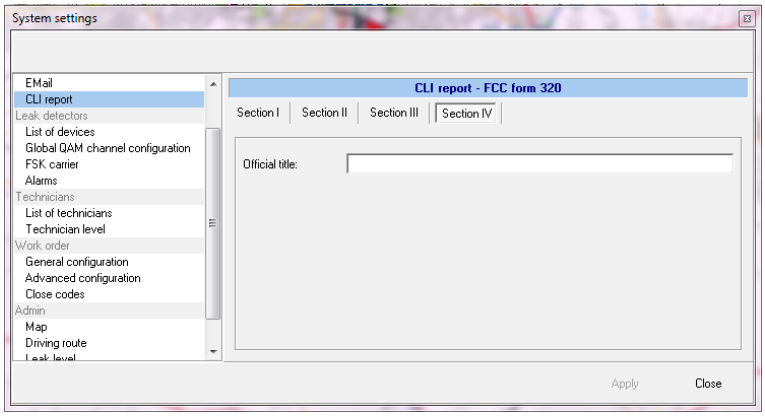
CLI report

QAM Snare Manager provides the ability to automatically generate the FCC form 320. This section is used for setup information, the actual report is generated through the Reports tab.



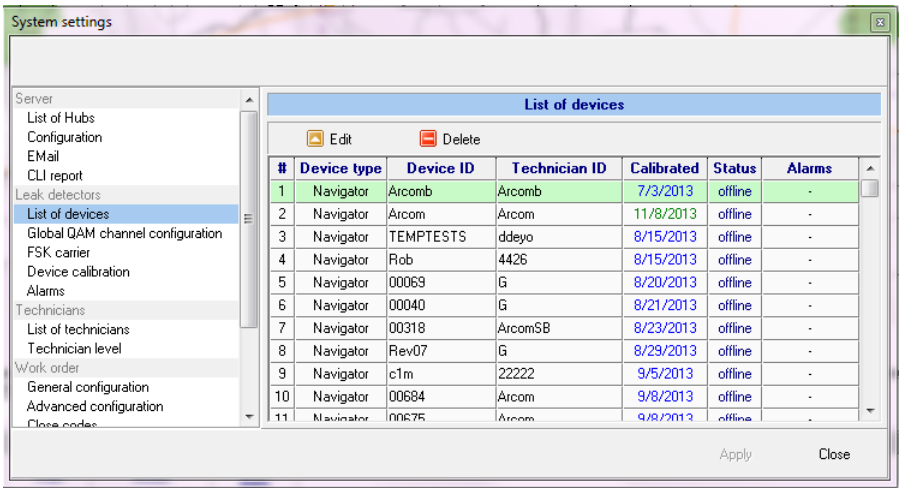






Leak detectors

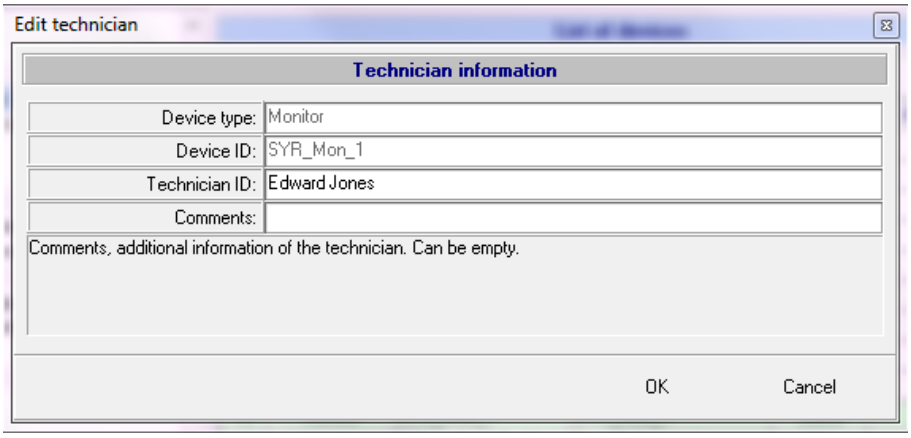
List of devices



#	Device type	Device ID	Technician ID	Calibrated	Status	Alarms
1	Navigator	Arcomb	Arcomb	7/3/2013	offline	-
2	Navigator	Arcom	Arcom	11/8/2013	offline	-
3	Navigator	TEMPTESTS	ddeyo	8/15/2013	offline	-
4	Navigator	Rob	4426	8/15/2013	offline	-
5	Navigator	00069	G	8/20/2013	offline	-
6	Navigator	00040	G	8/21/2013	offline	-
7	Navigator	00318	ArcomSB	8/23/2013	offline	-
8	Navigator	Rev07	G	8/29/2013	offline	-
9	Navigator	c1m	22222	9/5/2013	offline	-
10	Navigator	00684	Arcom	9/8/2013	offline	-

The List of devices table provides information on all Navigators and Monitors that have connected to the hub. Current status is indicated as either on-line or off-line. This status refers to whether or not the device is actively communicating with the hub – it does not indicate any alarm condition such as no GPS or no wireless. Information on these alarms is indicated in the Alarm column. The alarm conditions are defined and established in the Alarm section this Leak detector settings menu item.

Using the Edit and Delete buttons, devices can be deleted from the listing or information on the technician ID assigned the device can be edited. Device type and Device ID are configured on the Navigator and Monitor, and cannot be changed. If a user does change the Device ID on a unit, the next time it connects it will register with the new Device ID, and it would be a good idea to delete the old from the List of devices.



Global QAM channel configuration

Since QAM Snare can simultaneously process four channels, and since there will likely be many devices in the field that could potentially request more than the four

channels that the Server and Headend Signal Processors can provide – to avoid conflict some controls were necessary.

QAM Snare Monitor was designed primarily to be used passively with no driver/technician involvement. Typically one or two channels will be selected for high and low frequency leak monitoring, and the units will drive around passively acquiring data – to be fixed at a later time. QAM Snare Monitor is configured using the Q-browser software over a USB interface. Configuration parameters are IP address of the headend, information related to the GSM connection, and FSK parameters. The QAM channel is configured and controlled via the QAM Snare Manager program – the purpose being to ensure that there are no conflicts in more than four channels being requested, and to make it easy to switch frequencies on a fleet of vehicles, without necessity of going to each unit individually. QAM Snare Navigator works a little differently. Since it is designed to be used by line technicians to repair problems, and since it has an easy to use user interface – switching of QAM channels by the user is allowed – within certain parameters that prevent conflict. These parameters are again controlled through the QAM Snare Manager program and are explained below.

Within the Admin, in System Settings – there is the ability to configure the system in four ways:

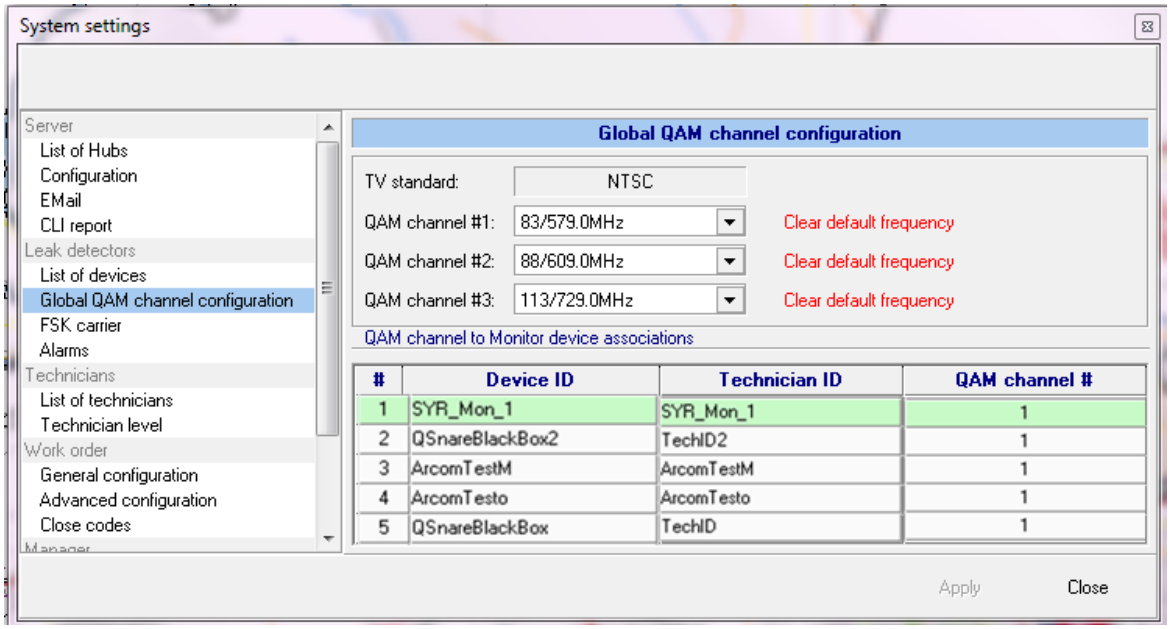
1 – No global QAM Channels configured – This setup would only be possible if no Monitors are used in the system, because setting at least one global QAM channel is required in order to use Monitor. In this configuration, The first four Navigators that connect to four different frequencies, reserve those frequencies until all users disconnect. As an example, assume four Navigators are operating at four different frequencies. If a fifth Navigator tries to connect at a fifth frequency, an error message would pop up on the screen of the fifth Navigator telling the user which four frequencies are available. This fifth user would have to use either of the four specified frequencies. If say the second user disconnected (assuming previously a fifth user didn't also connect to that channel), a frequency would then become open, and the fifth user could then connect to any channel. But obviously if the second user again tried to connect, he would be limited to the frequencies established by the other units. So it is easy to see that in a situation with many users all trying to do something different, that this configuration could be somewhat confusing and possibly frustrating.

2 – One global QAM Channel configured – This is a minimum required if any Monitors are used in the system. Here, all the Monitors in the system would have to operate on the one global channel specified. Navigators could tune to that channel, or any of the other three.

3 – Two global QAM Channels configured – This is required if a system wants to simultaneously use Monitors configured to different frequencies. In the Manager program the two channels are selected and the Manager program assigns which Monitor devices are set to which frequency. Navigators can select the global channels or as a group any of two other frequencies.

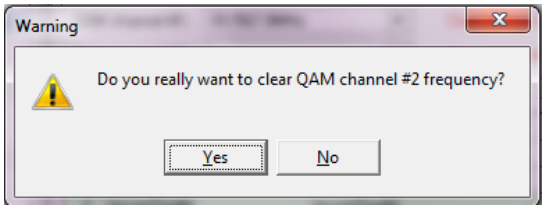
4 – Three QAM Channels configured – This is required if a system wants to simultaneously use Monitors configured to three frequencies. Navigators can select the global channels or as a group one other frequencies.

Global QAM channels are configured on the page to the right. From this menu item an Administrator can change either of the configured QAM channels, or clear a channel from being a default. Additionally, there is a table that allows Monitor devices to be assigned to operate on either of the two QAM channels.

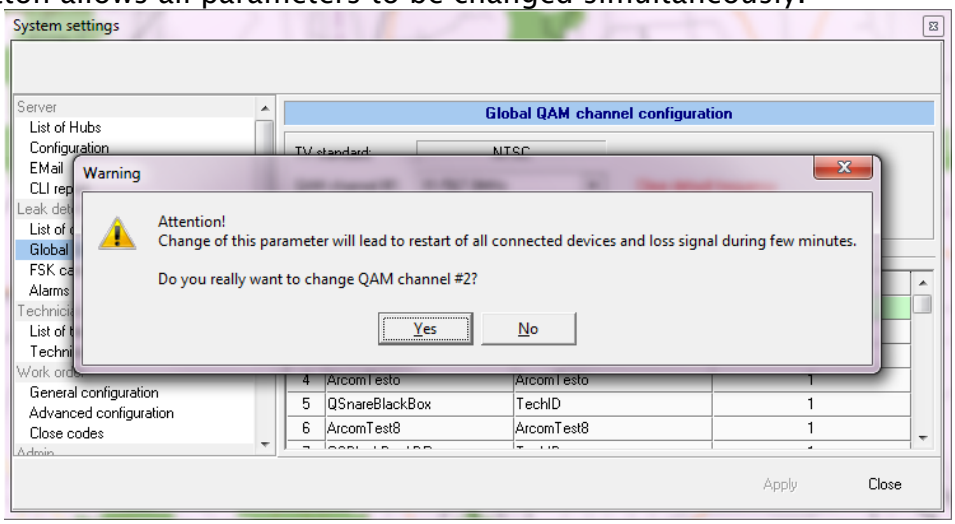


When selecting to clear or change a QAM channel, since any current users will be

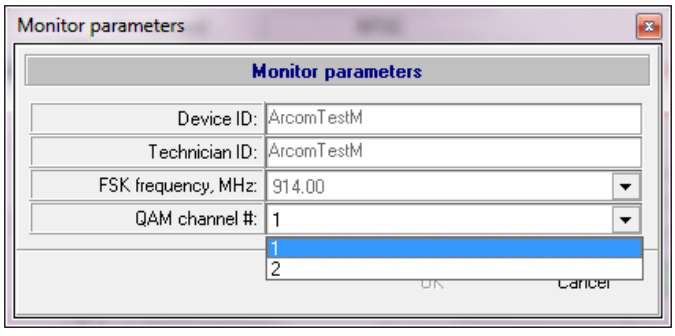
disconnected, warning messages appear that let the program user know that the changes will be made globally.



When multiple changes are made, different choices can be selected and the ***Apply*** button allows all parameters to be changed simultaneously.

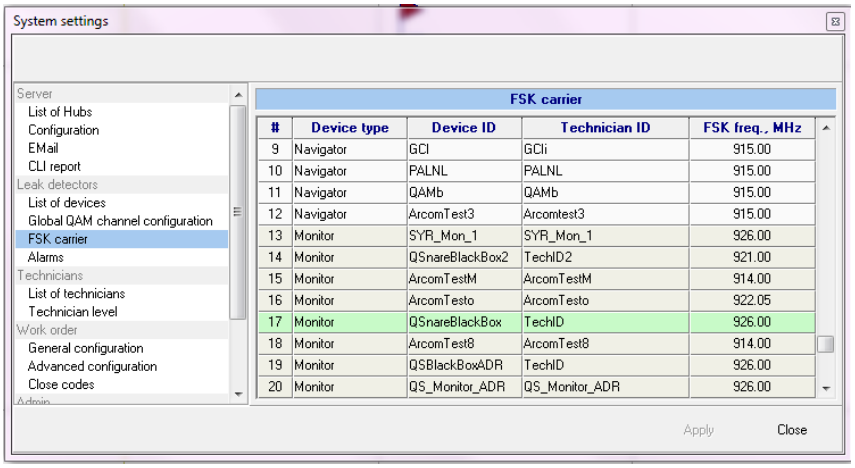


To change or to a assign a frequency to a newly connected Monitor, highlight the desired device in the table and hit enter, and then select either default channel 1 or 2 from the dropdown menu. And click OK when finished.

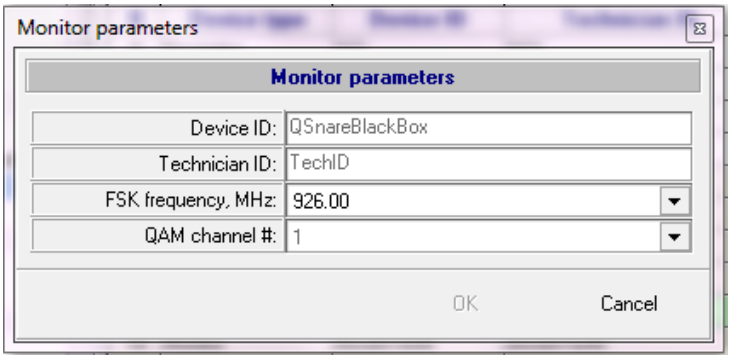


FSK carrier

The current settings for FSK carriers for all devices are displayed in this menu item. FSK for the Navigator is established by local device settings, and cannot be changed through the Manager program. It is listed for information purposes only. For Monitors, FSK is initially configured as part of the device setup through the Q-browser program – but it can be overridden by making changes through the Manager program. The FSK setting in the Manager program has higher priority than any FSK settings made locally through the Q-browser, so after initial connection with the hub the FSK for Monitors can only be changed through this Manager program.

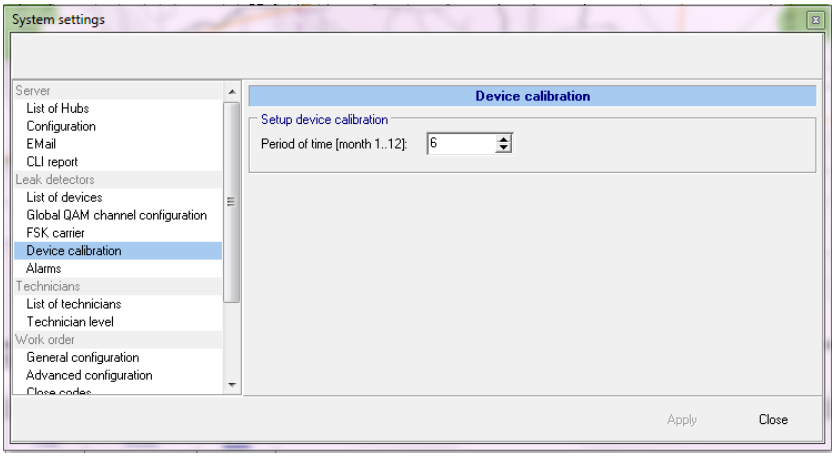


To edit the FSK for a Device, click on that device, change the FSK from the pulldown menu, then press ok. *You are only able to change Monitor devices (highlighted with shading to distinguish) – you will not be able to change Navigator devices (rows shown with a white background).*



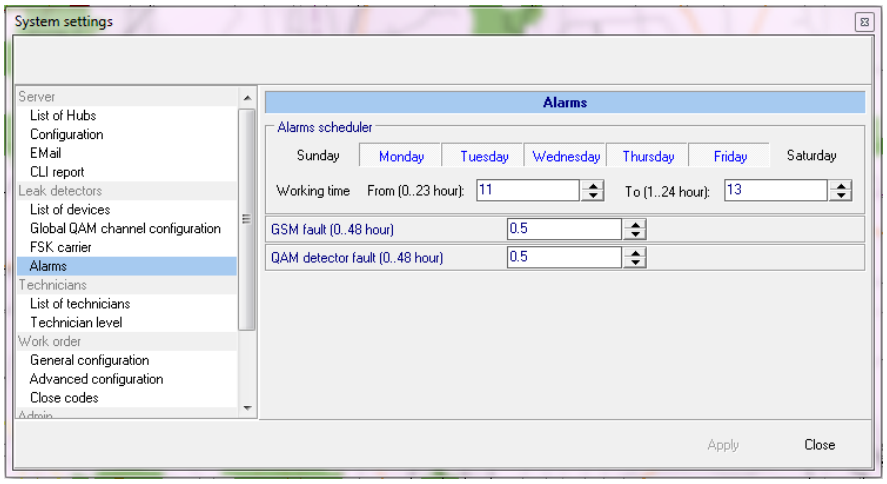
Device Calibration

QAM Snare Manager contains a built in system to ensure that devices are calibrated at a calibrated leak location within a desired period of time. Changes to



the calibration time period is configured here.

Alarms



Alarms are designed to provide feedback to managers and users when a Monitor device is not functioning properly for a period of time that corresponds to the work day. Alarms can be seen on either the Manager program under List of devices, or by using the web client. To cut down on unnecessary alarms and to provide a real indication of performance during the time the device is expected to be operational, an alarm scheduler is provided, such that alarm reporting only occurs during work days between working hours. To configure this feature, click on the day of the week to select and unselect, and then enter the hours for a typical work day. The time duration prior to generating an alarm during the work period can be selected for the two types of alarms, GSM fault and QAM detector fault. To disable this alarm feature configure the work day to not exist (i.e. working time is from 1 hour to 1 hour).

Alarms-GSM fault

A GSM fault is the generic name for the condition when the server does not receive any communication from the Monitor within the constraints of the configured work day and alarm period. The cause may be lack of power to the device (vehicle turned off), lack of wireless access point, lack of GSM or WiFi antenna, wrong server configuration, etc. Configuration is recommended to be beyond the typical time interval for a service call or lunch break period.

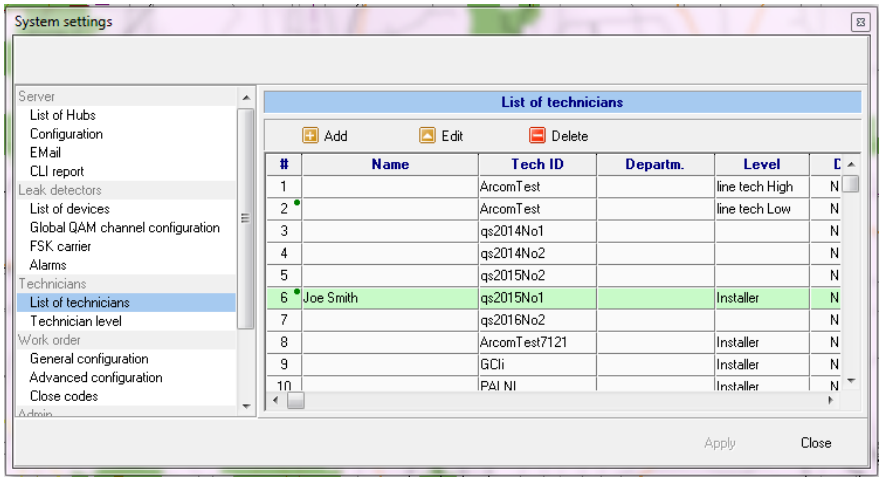
Alarms–QAM detector fault

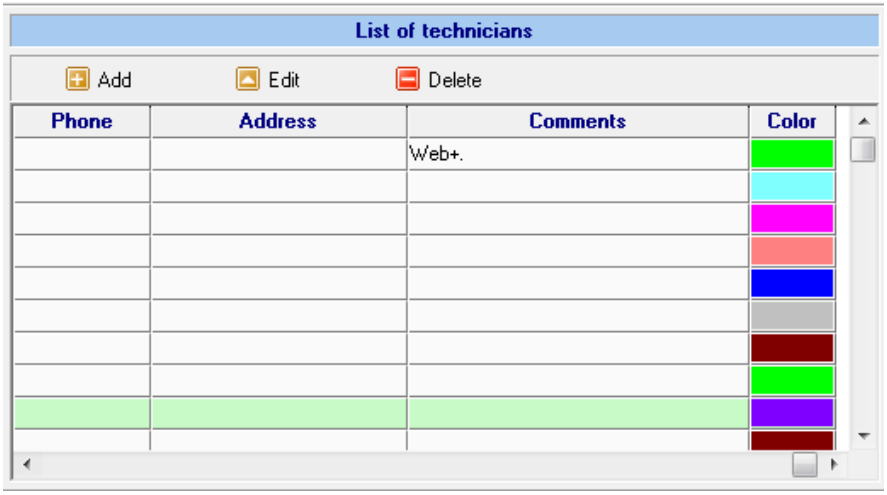
The QAM detector fault alarms under the condition of no leaks being detected by the Monitor within the constraints of the configured work day and alarm period. To avoid false alarms configuration is also recommended to be beyond the typical time interval for a service call or lunch break period, or the interval that it is expected that a leak should be detected.

Technicians

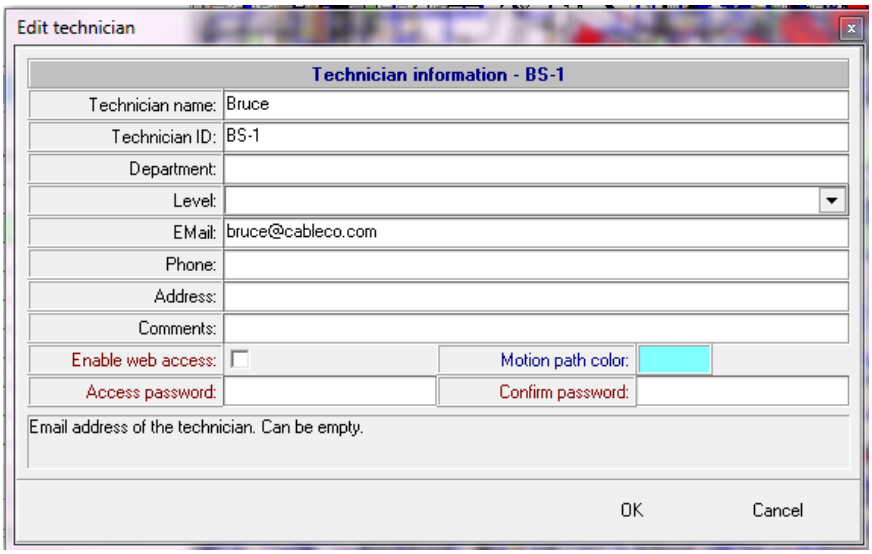
List of technicians

Information on technician assigned to various QAM Snare devices, and those that may be assigned work orders is maintained here. Whenever a QAM Snare Navigator or Monitor connects to a hub, it will automatically appear in this listing. At that point, information pertaining to the technician assigned to that particular device may be added. Scroll to the right to add more detailed information for each technician. If desired, color coding can be used when showing the drive route for each technician, such that when multiple drive routes are displayed in the Show Motion Path mode – each individual technician can be easily identified.



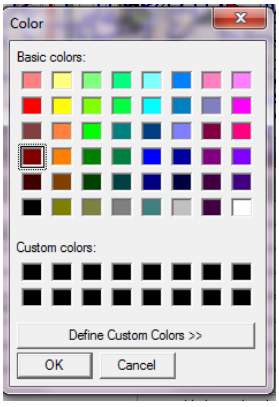


Click the edit button to edit information on a technician, this method is also used to enable Web access.



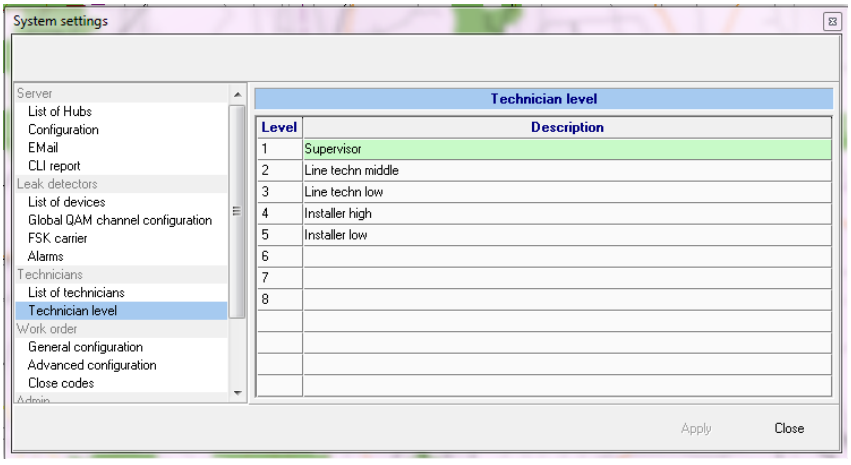
Click the Add button to Add a new technician. If a technician is added in this fashion, he is always assigned as having a QAM Snare Isolator.

Clicking on the Motion path color opens a pallet, such that a color can be assigned to the technician. Press OK to confirm.



Technician level

Based on various configurable leak criterion, Work orders can be assigned to certain level technicians. Technician descriptions and levels are kept here, select the line item to edit or delete.

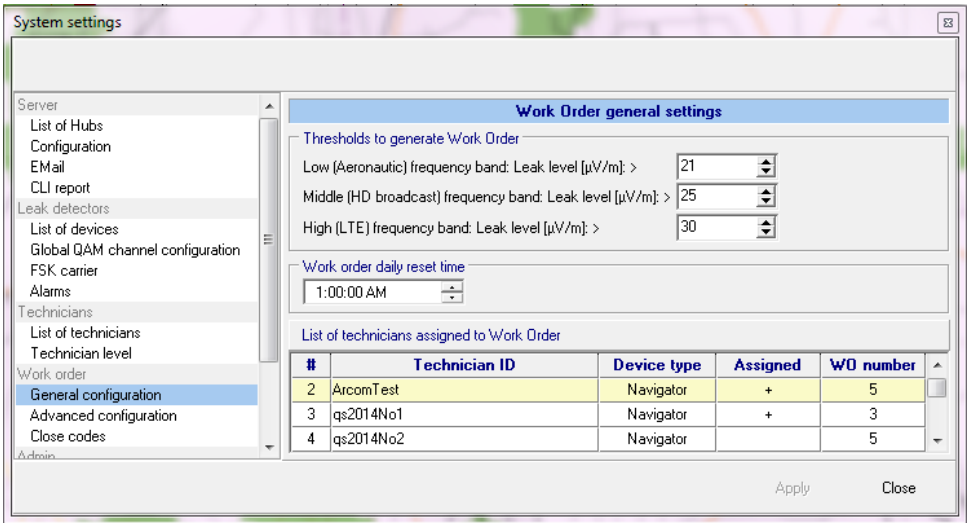


Work order

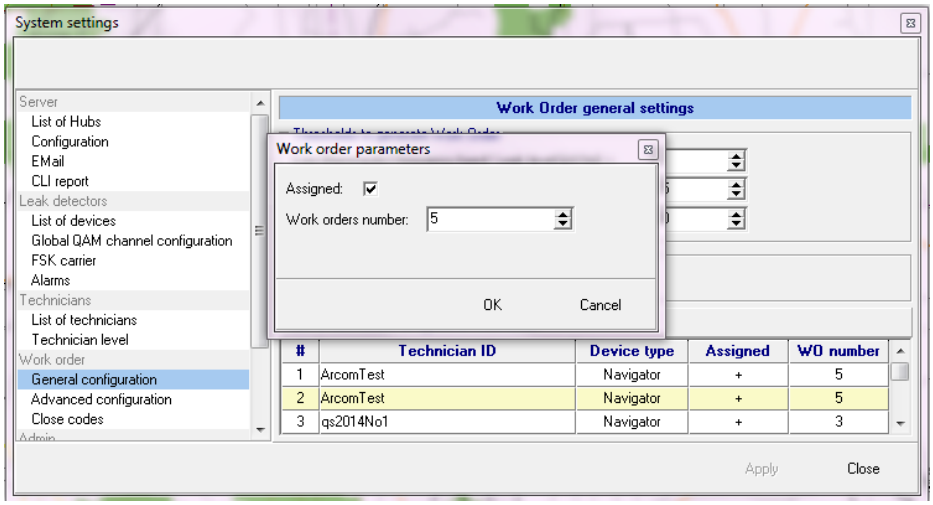
QAM Snare contains a built in work order system that can automatically assign leaks to be repaired by technicians. The way in which work orders are assigned is configured in the Work order General configuration tab and in the Advanced configuration tab. Additionally, work order close codes can be edited in the Closed code tab. Along with information about the device and technician, it shows whether or not a Technician has been assigned to automatically receive work orders, and how many work orders per day are assigned. Leak thresholds above which leaks are assigned is also indicated here, as well as the Work order time, which specifies the time of day when the next group of work orders are assigned.

General configuration

In the General configuration tab the threshold leak level above which work orders are automatically assigned is defined. This threshold level can be set to different values for each of the three frequency bands (aeronautic,HD broadcast, and LTE). Work order daily reset time is defined as the time of each day when the assign work order process task is performed. The List of technicians assigned to work orders establishes which technicians are given work orders, and how many per day they are given.



In the table above, the presence of the + symbol shows that only technician # 2 and 3 on the list are assigned work



orders, and in the case shows #2 is assigned 5 and #3 is assigned 3. To change this, click on the technician ID – and the Work order parameter box will appear. Simply check the box if this technician is to be assigned work orders and change the quantity per day with the up/down arrows.

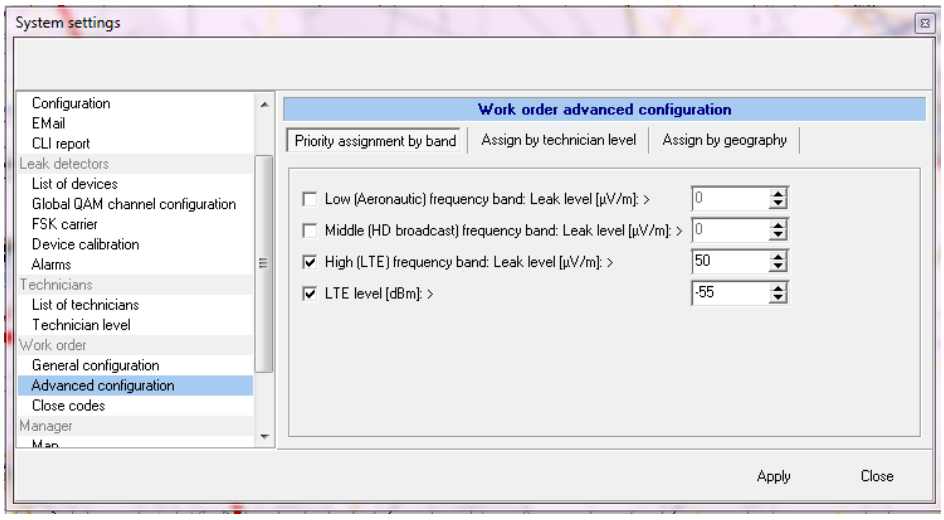
Previous work orders need to be closed before new work orders are assigned. For example, if a technician is assigned 5 as the number of work orders he is given – if only one was closed during the day, then on the subsequent day only one additional work order will be assigned. If all 5 were closed, then 5 new would be assigned. A maximum of 10 work orders can be assigned to each technician each day.

Advanced configuration

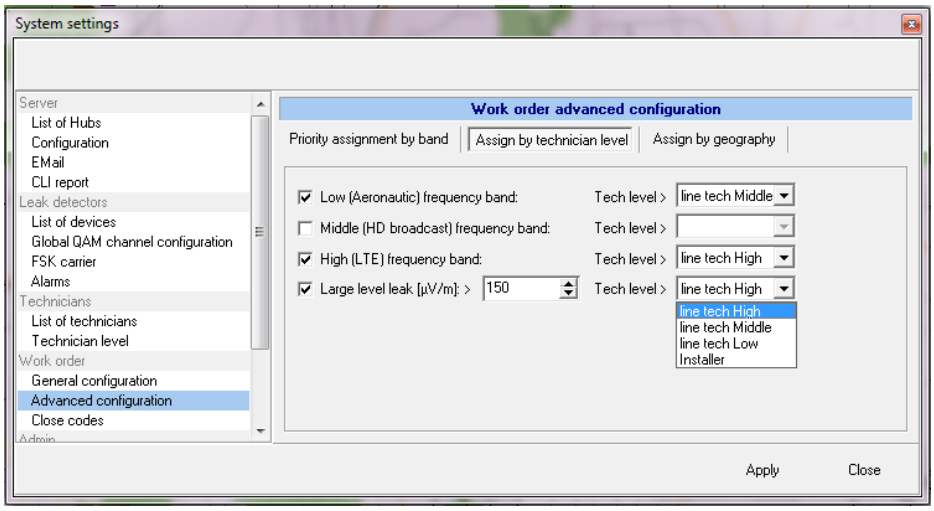
Advanced work order configuration allows for work orders to be assigned on a priority basis for certain high level leaks and importantly for detected LTE signal level. It additionally allows assignment by technician level and assignment based on geography.

Work order –priority assignment by band

As shown below, selecting this option puts work orders that meet this criterion at the top of the list to be assigned. Leaks can be priority assigned for different defined amplitudes within each of the three leak bands, and importantly can also be assigned based upon detected LTE signal level. LTE signal level provide a very useful indication as to the potential for a particular leak to the be source of an LTE problem.

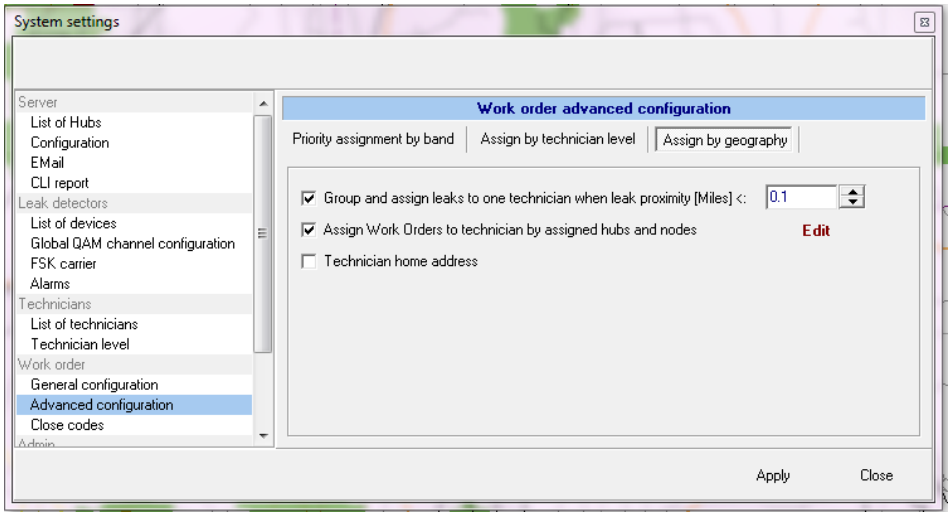


Work order –priority assignment by technician level



If desired, leaks can be assigned to a certain level technician based on the characteristics of the leak. For example, LTE leaks are predominantly hard line problems – which should go to line techs. Low frequency leaks are typically soft cable which would be assigned to fulfillment techs. So each of the three frequency bands can have leaks assigned to certain types or levels of technicians, or alternatively any large level leak detected, regardless of band – can be assigned to a certain level technician. The listing of technician and level can be customized in System settings – Technicians – List of technicians & Technician level.

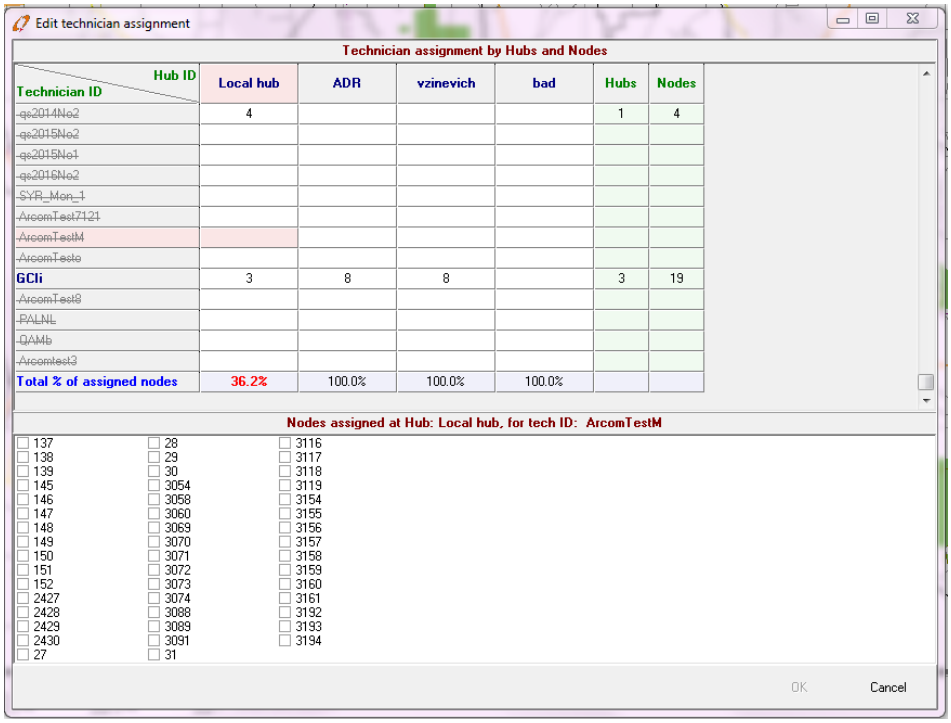
Work order –priority assignment by geography



Work orders can also be assigned based on geographical features such as the detected leaks being in close physical proximity to each other. This makes for cost effective and efficient drive time. In the box below simply check the box and select the proximity distance.

Work order can also be assigned based upon hubs and nodes that are assigned to various technicians. Check the box for this category and then press the edit button to configure. The screen below will appear. A listing of all hubs attached to the master is

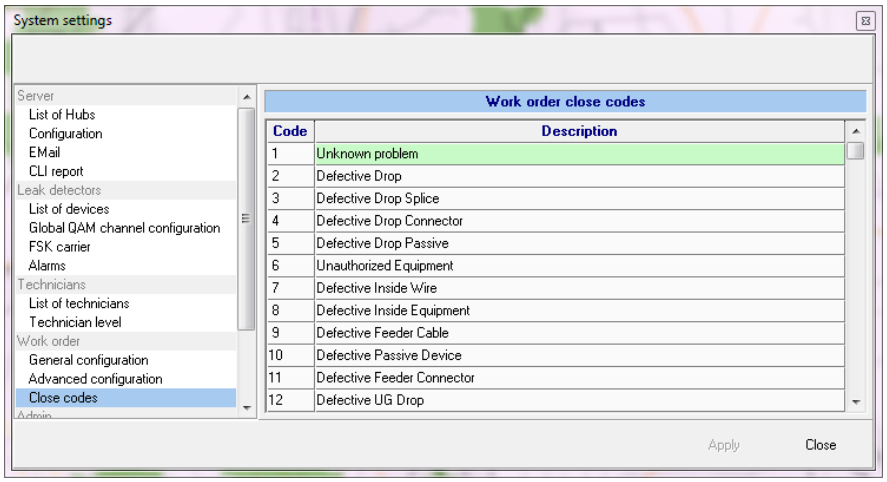
shown on the X axis, and on the Y axis is a listing of the technician ID's that are assigned to a QAM Snare device. **If the technician ID is not set up to receive work orders, then his name is crossed out. To enable, go into system Settings – Technicians, and allow work orders for that technician.**



To make changes to assigned nodes and hubs, click on the white grid space that corresponds to the desired technician and hub. A listing of all nodes in that hub will appear as is shown below. Click on as many as desired, or right click to select all or clear all. Statistics on the number of assigned nodes are shown on the bottom row.

Close codes

It is often desirable to track and look at statistics related to the cause of leaks and physical impairments in the plant. As such a close code list is provided. This list is editable by any Manager program user, line items can be changed, deleted, or added. The complete close codes list is transmitted to each QAM Snare Navigator as part of its startup procedure, so its code listing is always current. Other than this Manager program, the



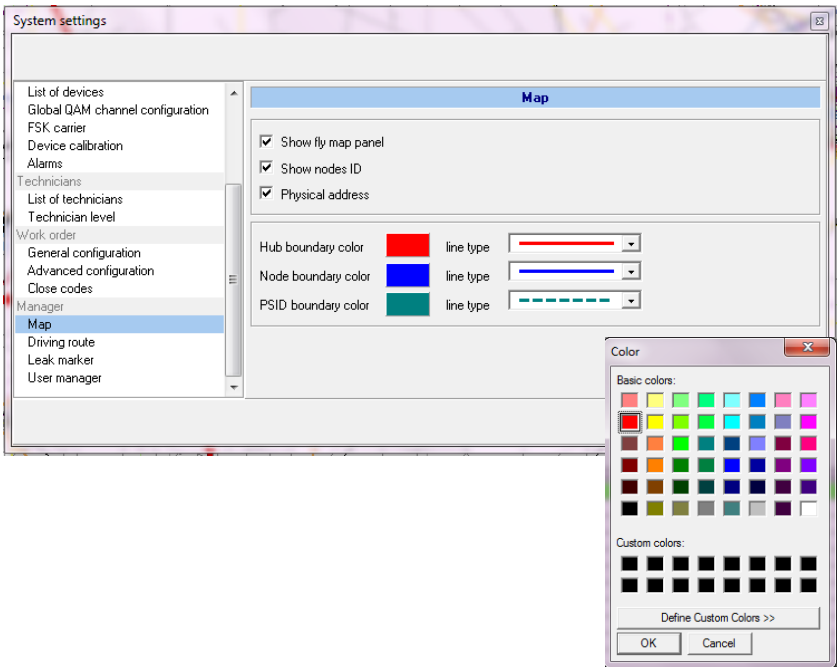
other method to enter close codes is through the web client, which uses this same database as its close code source.

Manager

These settings establish how maps and leaks are displayed locally when viewed usign the Manager program. These settings do not change how data is stored in the database. Through the user manager password and user ID access to the Manager program can be controlled.

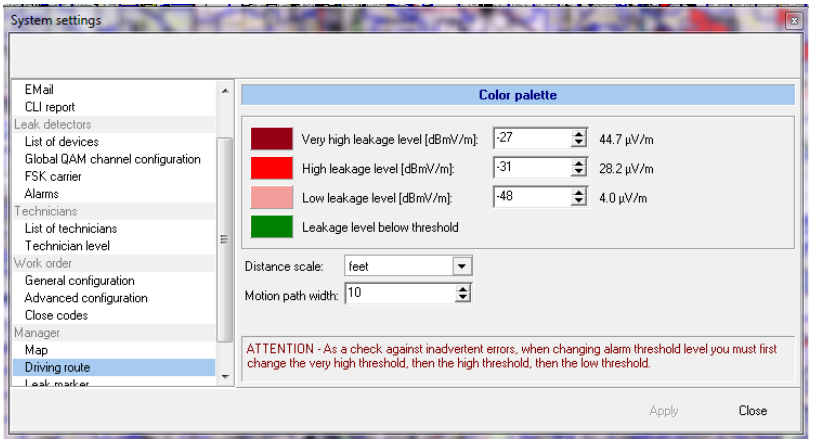
Map

This changes various items displayed on the maps. Node, Hub, and PSID boundary colors and line styles can be changed by clicking on the color or selecting from drop down. These changes only affect how the information is shown on the users software and is not changed globally. Click Apply to accept changes.



Driving route

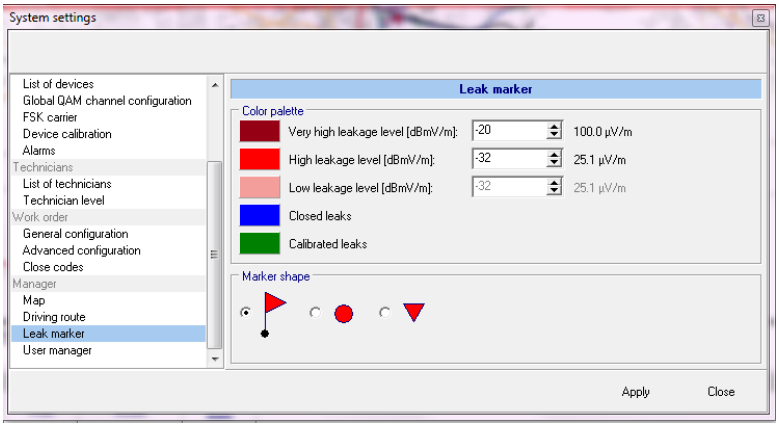
This allows the user to change the drive route marker indications based upon recorded leak level. If for example you want to ignore all leaks below a certain threshold,



simply adjust the setting accordingly. Motion path width changes the size of the marker when displaying a drive route in the Show Motion Path mode.

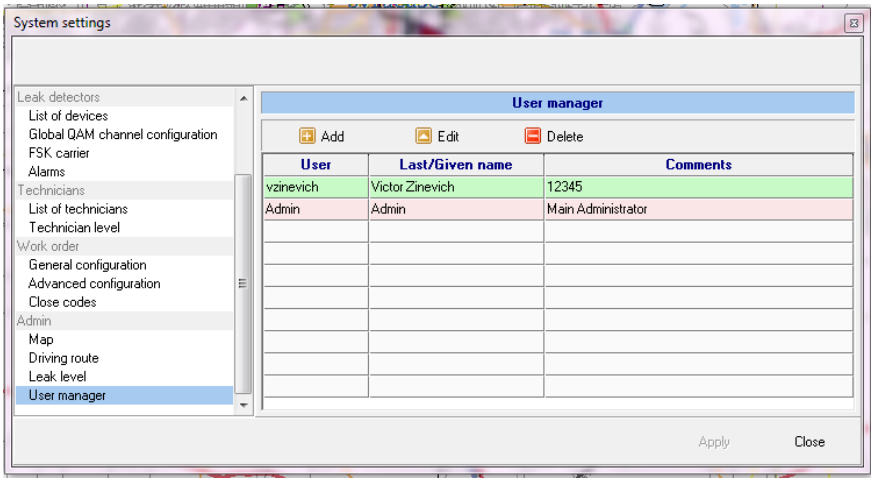
Leak marker

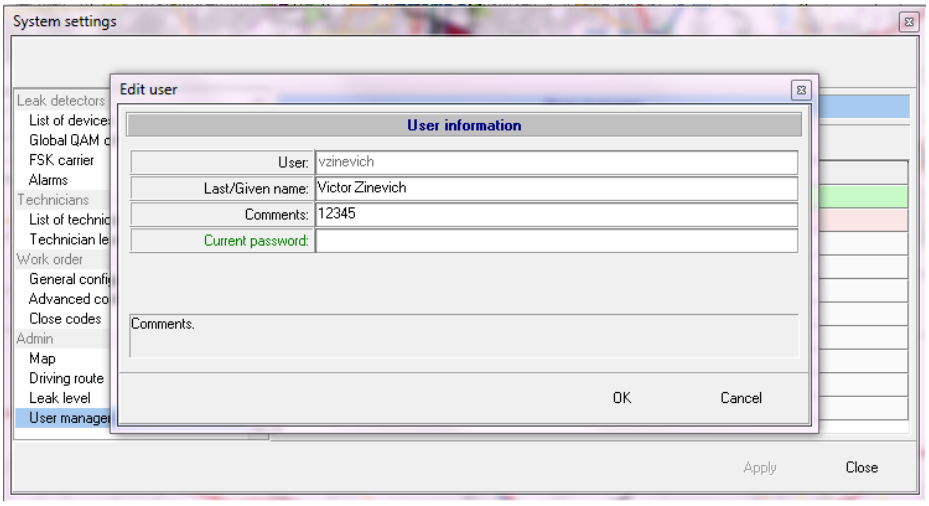
This allows for different color flags to be displayed depending upon leak magnitude. Simply adjust the leak magnitude up or down based on how you want to display. The shape of the displayed marker can also be selected.



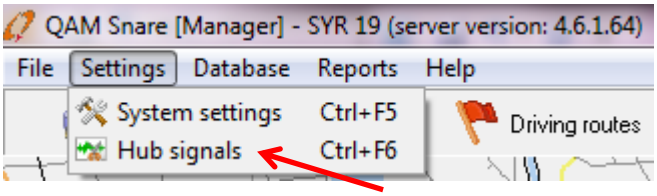
User manager

The user manager setting allows an administrator to grant access to other users to this Admin program. It also provides a mechanism for users to change their own password.

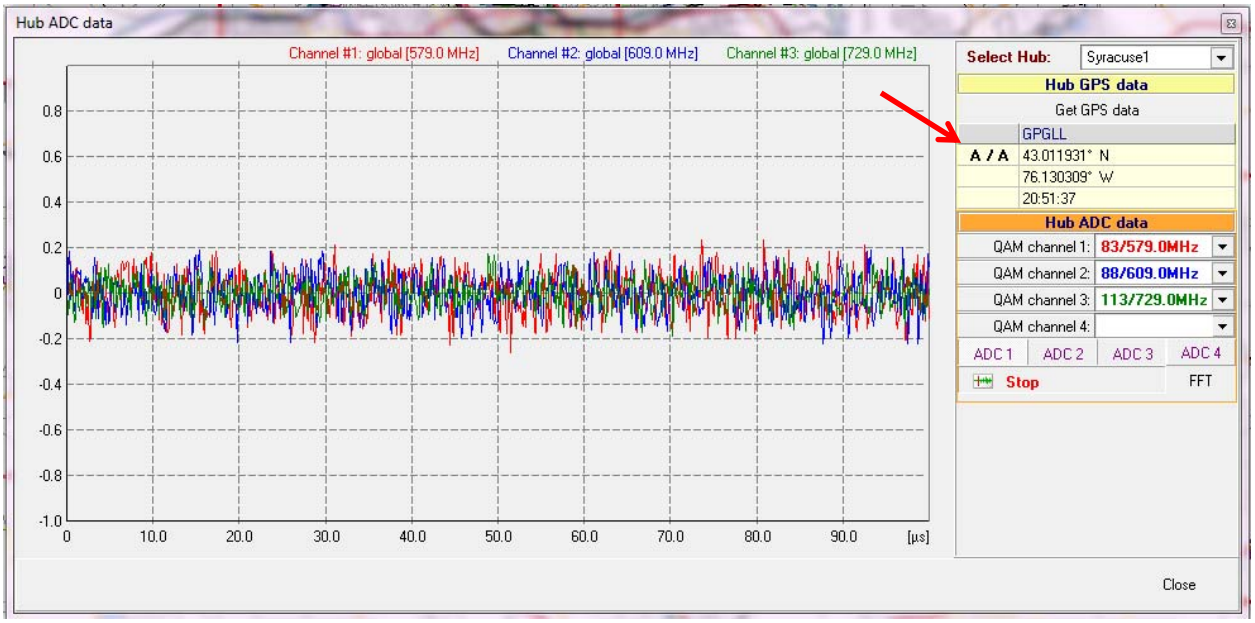




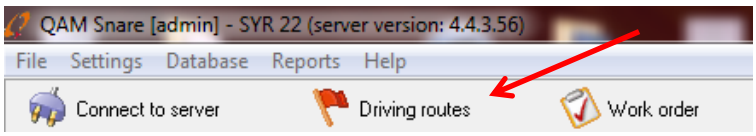
Settings – Hub Signals



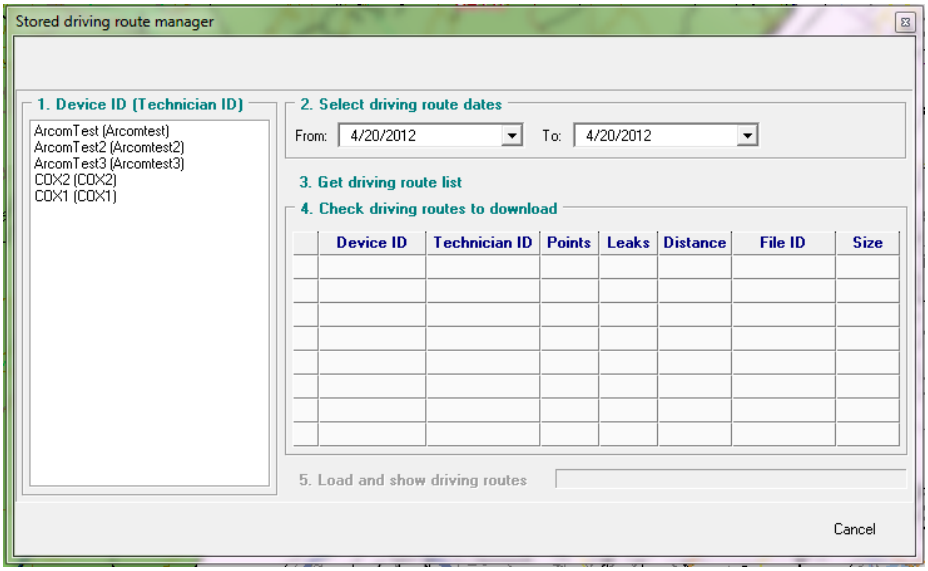
The hub settings menu item allows the user to look at actual signals being sampled at the headend signal processor. First select the hub you want to look at from the pull down menu at the upper right. If there is only one hub installed it will show as Local hub. Click on Get GPS data to see if GPS is locked and operating properly. **It is critical that the GPS setting indicate A/A to ensure GPS is locked.**



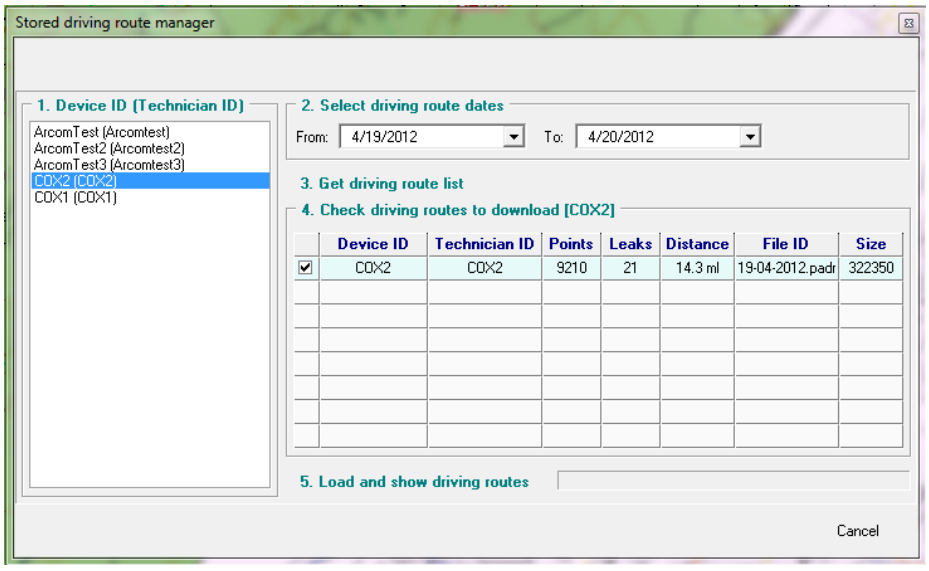
Driving routes

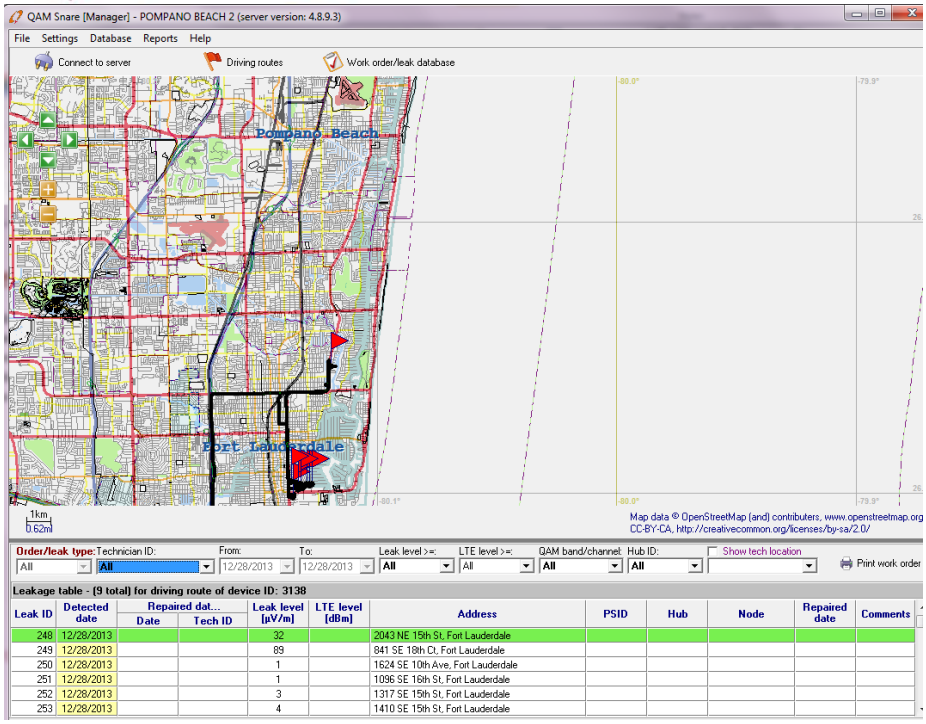


To view driving routes for individual Navigators and Monitors that are stored in the QAM Snare database, select this item. In the selection box, pick the Device ID you would like to view, select a range of route dates to pick from. Then click on button #3, Get driving route list.

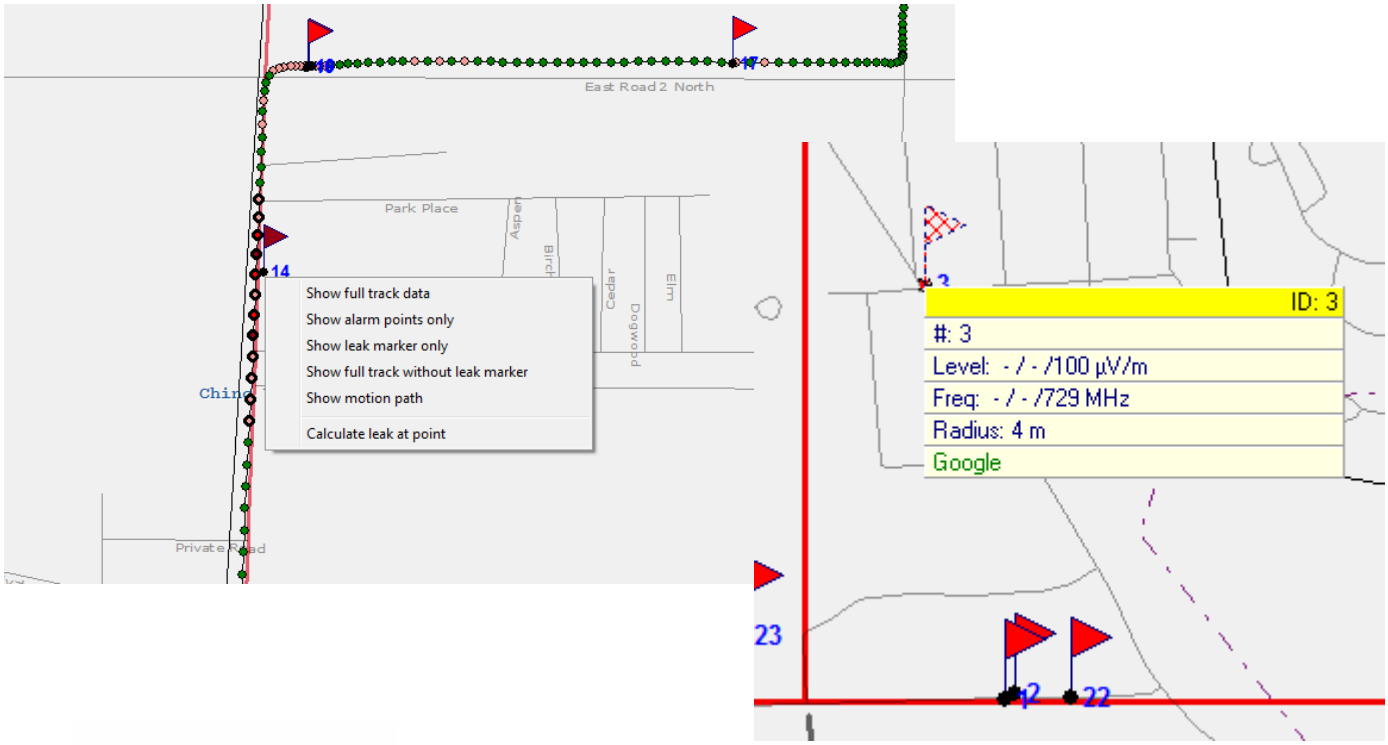


A listing of routes is shown, click on the desired route or routes, and then press the next button #5. The full route will appear.



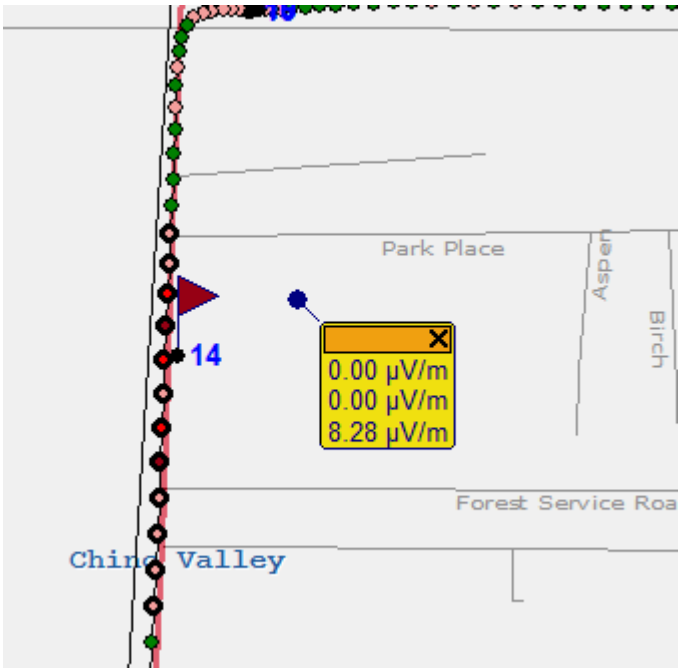


To view detailed information on a leak, right click on the flag and information about the detected leak, including a circle showing the leak radius will appear. In the example to the left, the leak was detected only at 729MHz, and the other frequencies are shown as blank. To get additional information on the detected time delay, press CTRL as you click on the leak.



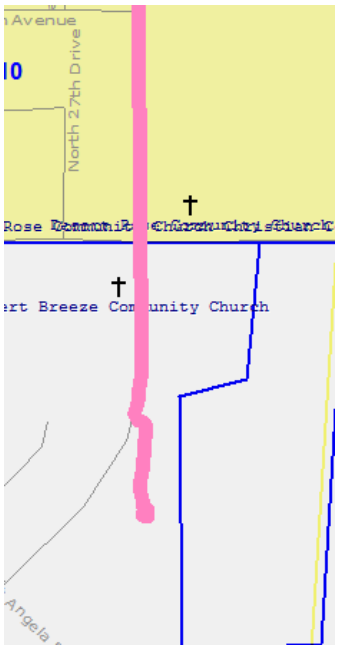
Calculate leak at point

The software contains a useful utility that has the ability to show the leak level at any location. Move the mouse to any location on the map and right click, the select Calculate leak at point. An information box appears that shows the leak level at the desired location, that is resultant from the existing leaks in the database. The three lines of information correspond to the three configured detection bands. In the example to the right leakage was only being monitored at the high frequency band.



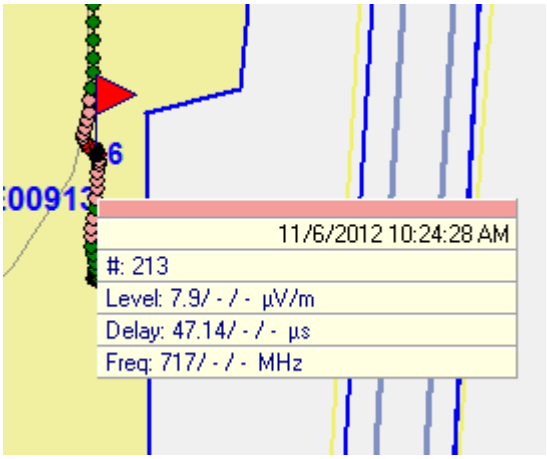
Show motion path

Clicking on Show motion path provide for an easier to view color coded line of the drive path. The color coding and line weight can be customized under System Settings, List of Technicians.



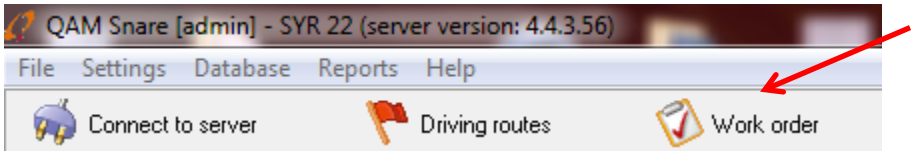
Detection point leak characteristics

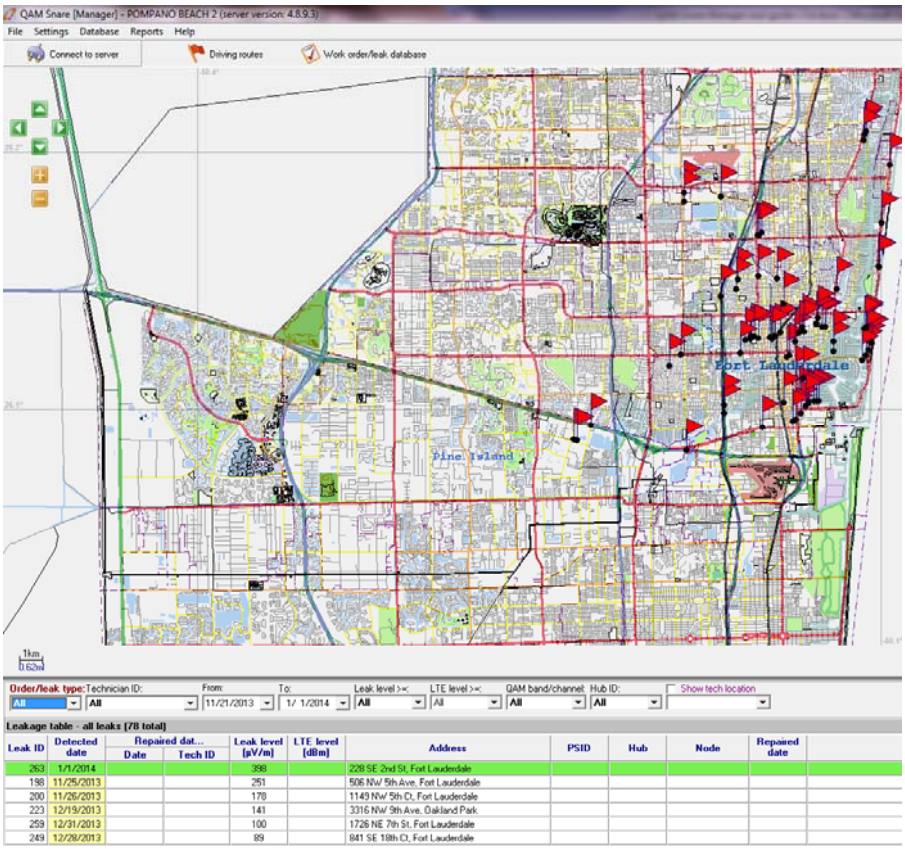
Left clicking on any alarm point provides detailes on the detected level and frequency for that data point.



Work Order / Database

The Work Order / Database button gets you back to the default startup screen. This would be used for example, after you view a drive route and want to get back to the main database.



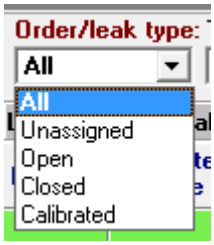


Structure of the database

The QAM Snare database contains a significant amount of information. For each detected leak information on leak level, detected channel, detected LTE signal level, GPS coordinates of leak, radius of potential location, technician ID that detected the leak, QAM channel it was detected on, hub ID, status of the leak, close code, etc. By selecting different options from the pulldown menu below, leaks can be displayed in a variety of ways to suit user preference.

Leak status definitions

Each detected leak has a status related to what was done with the leak relative to work orders.

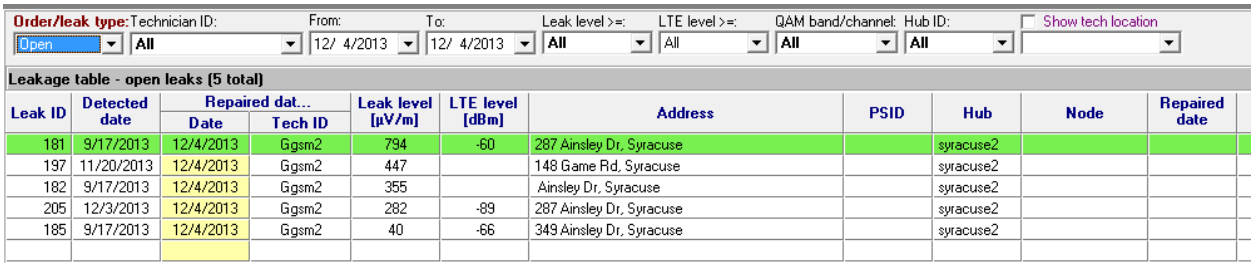


Unassigned leak

An unassigned leak is any leak that has not yet been assigned a work order for repair.

Open leak

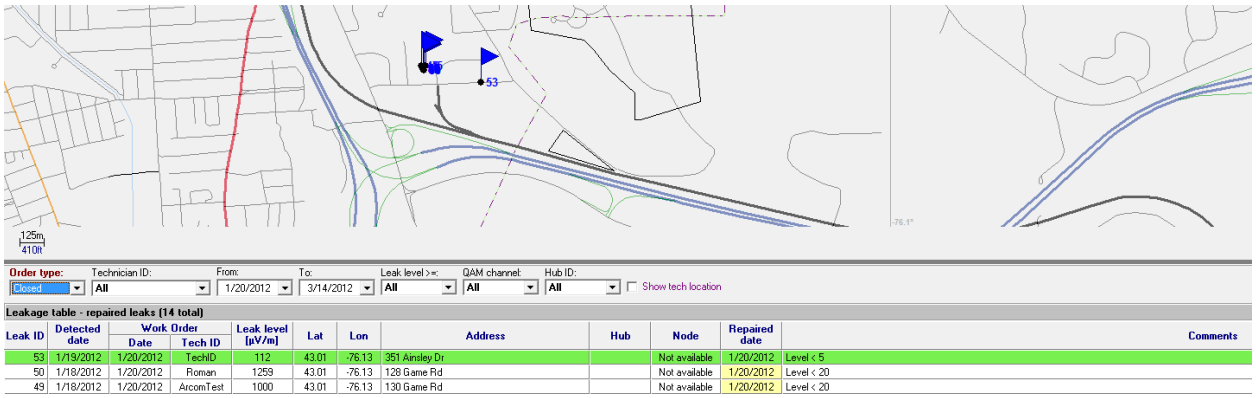
An open leak is any leak that has been assigned a work order to be repaired, but repair has not yet been completed.



Leak ID	Detected date	Repaired dat... Date	Repaired dat... Tech ID	Leak level [µV/m]	LTE level [dBm]	Address	PSID	Hub	Node	Repaired date
181	9/17/2013	12/4/2013	Ggsm2	794	-60	287 Ainsley Dr, Syracuse		syracuse2		
197	11/20/2013	12/4/2013	Ggsm2	447		148 Game Rd, Syracuse		syracuse2		
182	9/17/2013	12/4/2013	Ggsm2	355		Ainsley Dr, Syracuse		syracuse2		
205	12/3/2013	12/4/2013	Ggsm2	282	-89	287 Ainsley Dr, Syracuse		syracuse2		
185	9/17/2013	12/4/2013	Ggsm2	40	-66	349 Ainsley Dr, Syracuse		syracuse2		

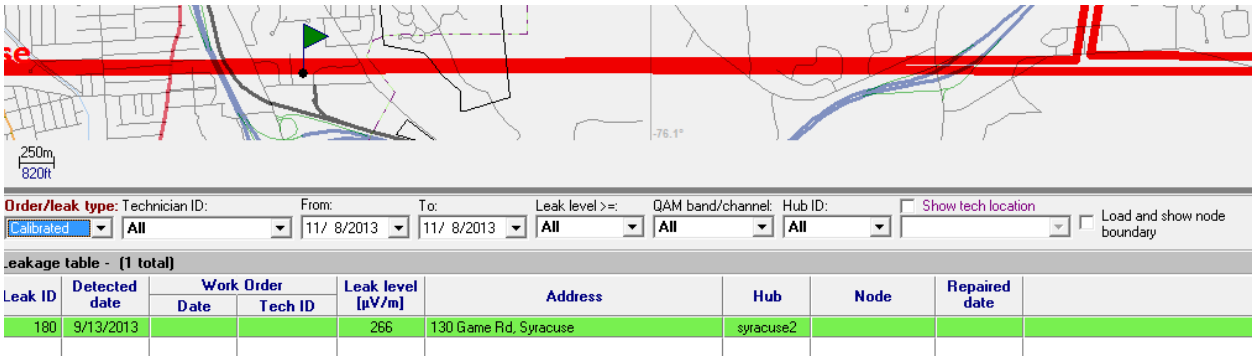
Closed leak

A close leak is a leak that was assigned a work order, where the work order was completed and status changed to closed. When displayed on a map, closed leaks are always displayed with blue flags (unless color was changed). Additionally, closed leaks also contain information as to when they were closed, which technician performed the close process, and close code information as to the cause of the problem as well as the level of the leak post fix. Leaks can be closed through the Manager program, the web client, or directly from a QAM Snare Navigator field unit.



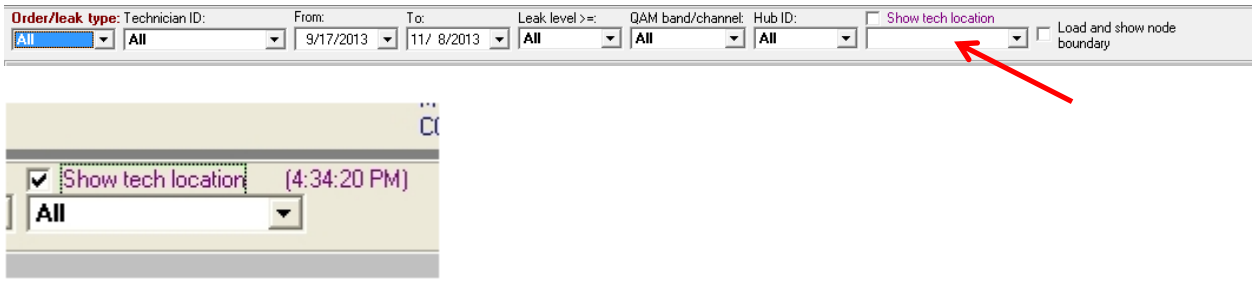
Calibrated leak

A Calibrated leak is one that was created specifically for the purpose of calibrating devices with the antennas, cables, filters, and combiners used in the vehicle. Calibration locations are shown with a green flag.



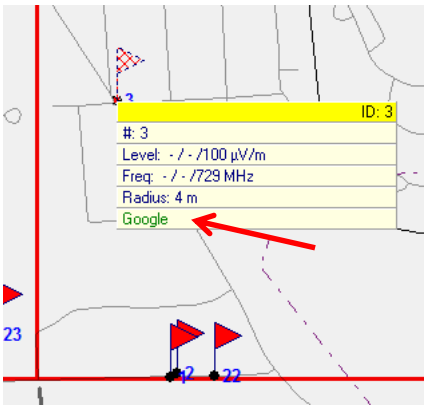
Show tech location

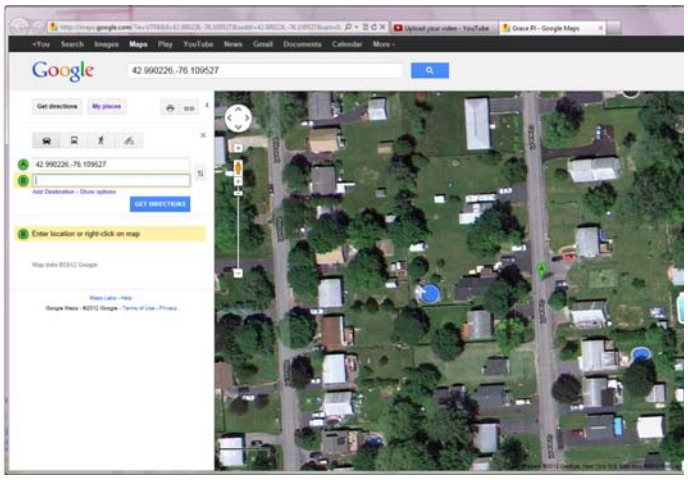
By selecting the show technician location box, the current location of each technician will be displayed on the map. Technician can be selected via pulldown.



Google view –satellite

After right clicking on any leak, press the Google button and a Google map will be displayed.

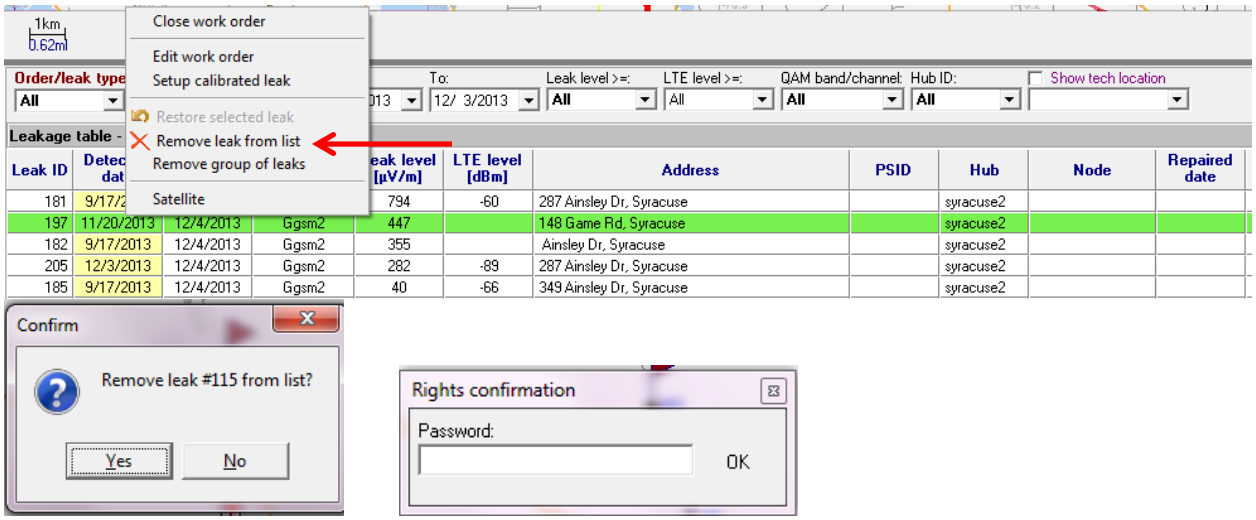




An alternative method is to right click on any leak in the database, and click on Satellite

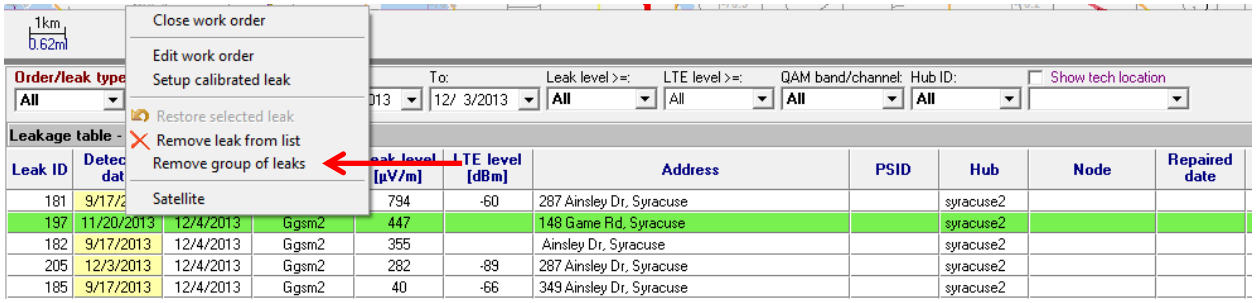
Remove leak from list

In order to remove a leak from the database, select the desired leak by right clicking. You will be asked to confirm that you do want to delete this leak, and then you will be required to enter the password to delete it.

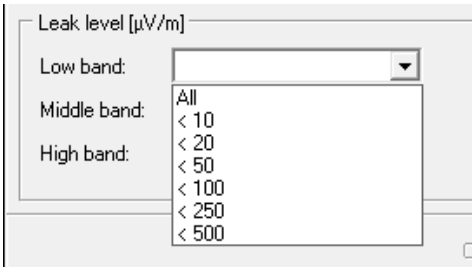


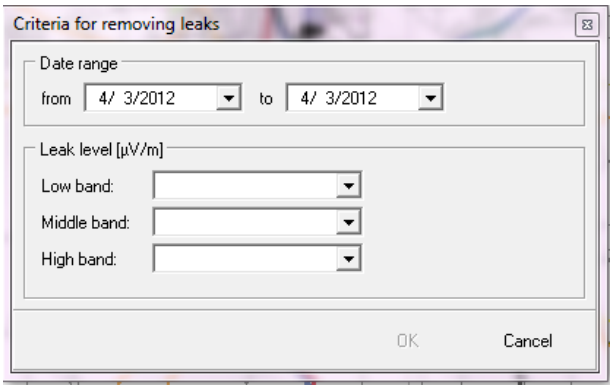
Remove group of leaks

In order to remove a group of leak from the database, right click on Remove group of leaks text.



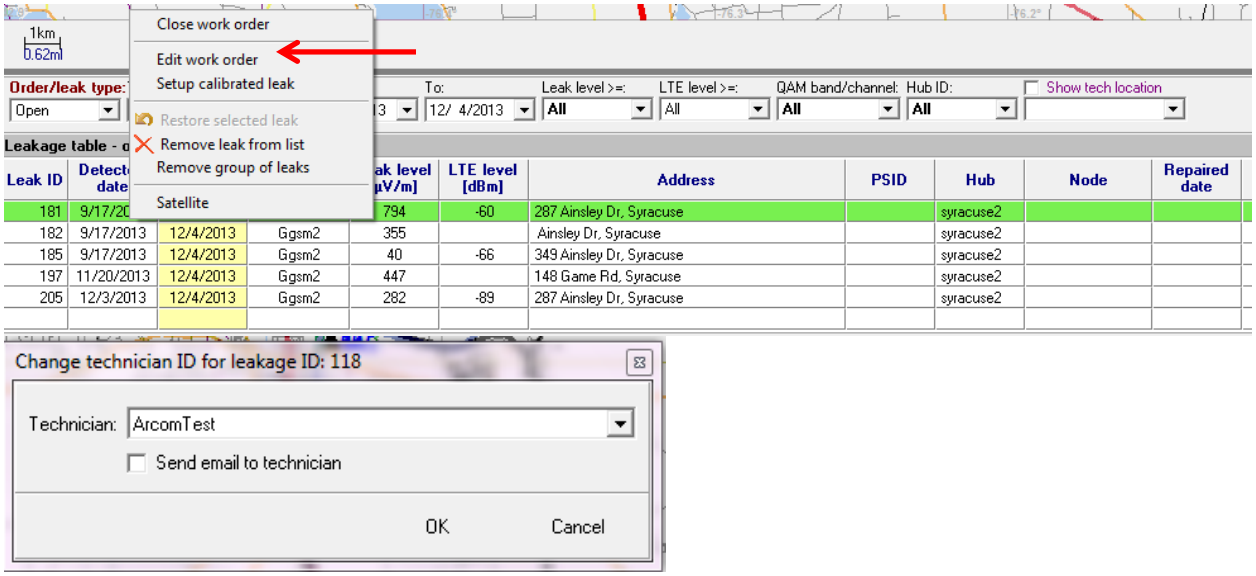
After the rights confirmation you will be prompted to select the criterion upon which to remove leaks. Date range and leak levels can be selected.



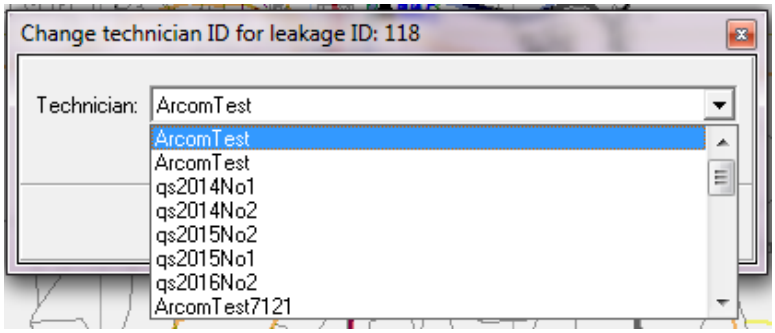


Edit a work order – reassign to a different technician

To reassign an existing open work order to a different technician, right click on the desired open work order.

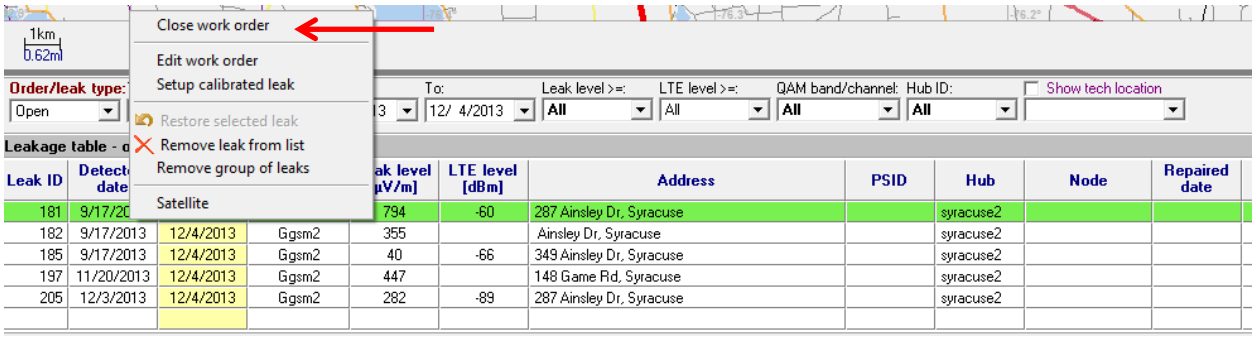


Then select a different technician from the dropdown list and it will be reassigned, a confirming email will be sent if the email box is checked.



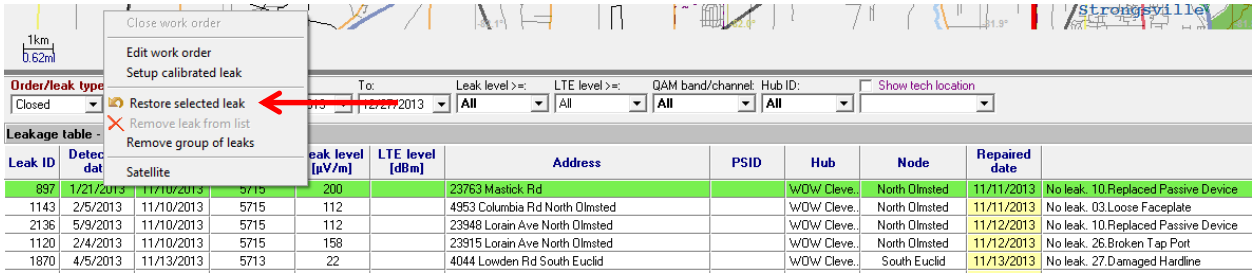
Close a work order from Manager Program

To close a work order, right click on it and select Close work order. Add technician information and close code and confirm.

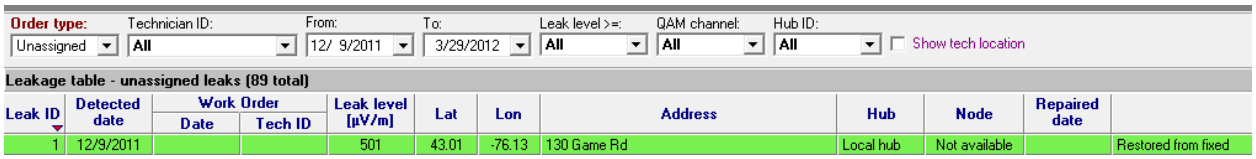


Undo a previously closed leak

If a leak was closed in error, it can un-done. From the listing of Closed orders, right click and press restore selected leak.

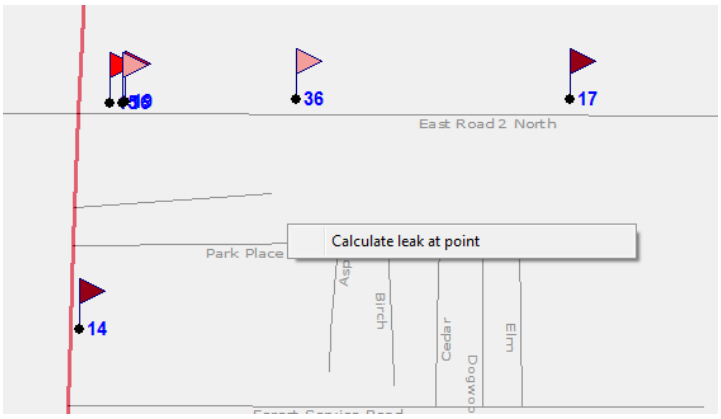


After confirming, it will be considered an unassigned leak, with the comment that it was restored.

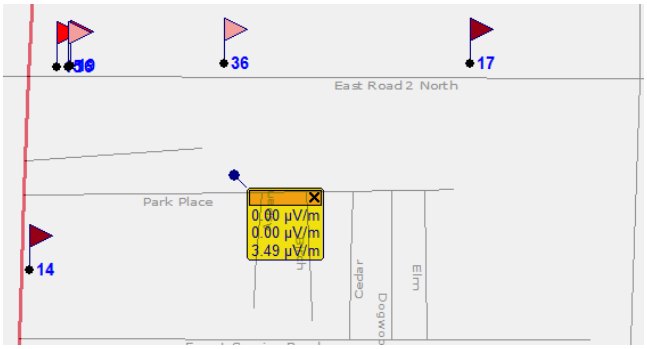


Calculate leak at point

The software contains a useful utility that has the ability to show the leak level at any location. Move the mouse to any location on the map and right click, the select Calculate leak at point. An information box appears that shows the leak level at the desired location that is resultant from the existing leaks in the

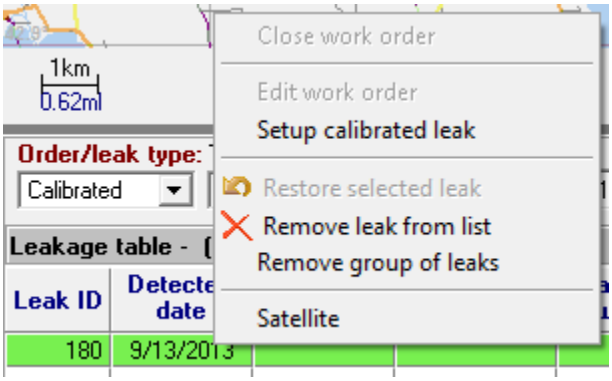


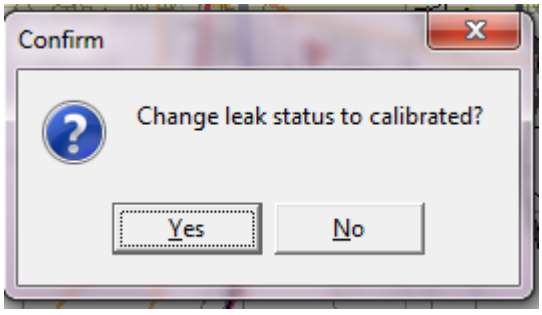
database. The three lines of information correspond to the three configured detection bands. In the example to the right leakage was only being monitored at the high frequency band.



Setup Calibrated leak

Calibrated leak locations can be created that can allow for automatic device calibration. Leak setup should only be performed by a technician familiar with the calibration process and calibration instruction provided by Arcom. After the calibrated leak is recorded in the database at the desired location, the status of the leak is changed from Unassigned to Calibrated. A dialog box will appear asking if the leak status should be changed. Only Global QAM channels can be calibrated.

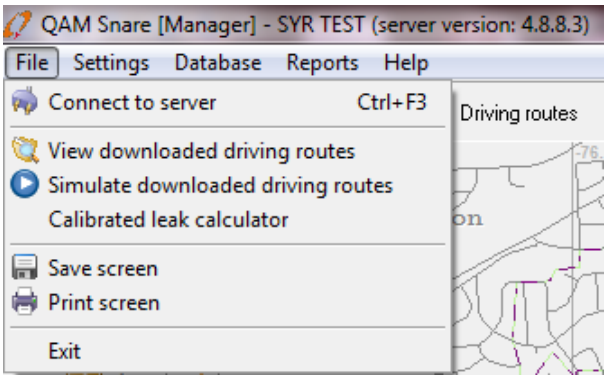




File

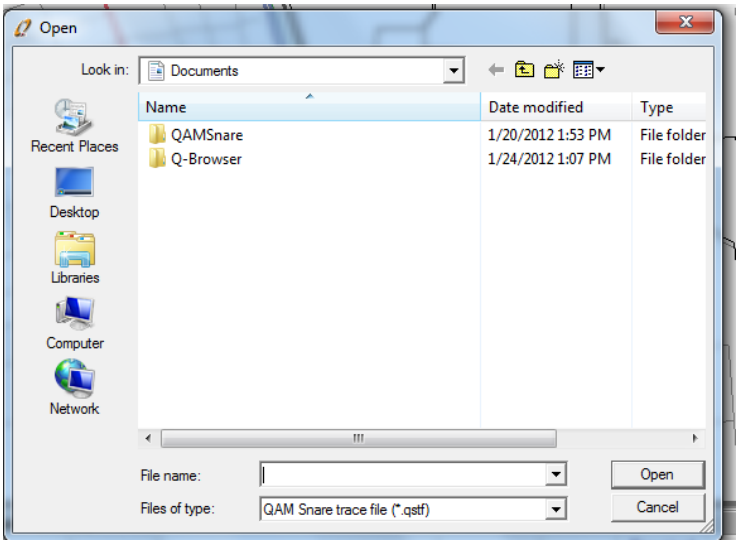
The File menu item provides alternative access to Connect to server, and it provides

the ability to Print and Save screens, and to exit the program. Additionally it allows the user to view and simulate previously stored drive routes and to use a tool for calculating the value of calibrated leaks.



View downloaded driving routes

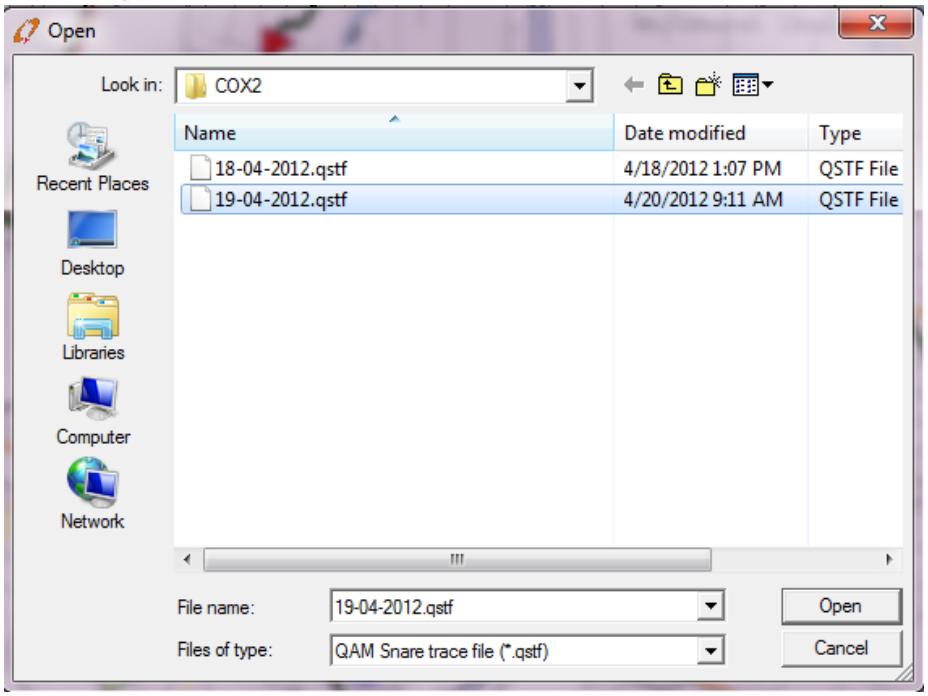
Any driving routes that have been previously downloaded onto the PC running the Manager program can be viewed again by selecting View downloaded driving routes from the File menu.



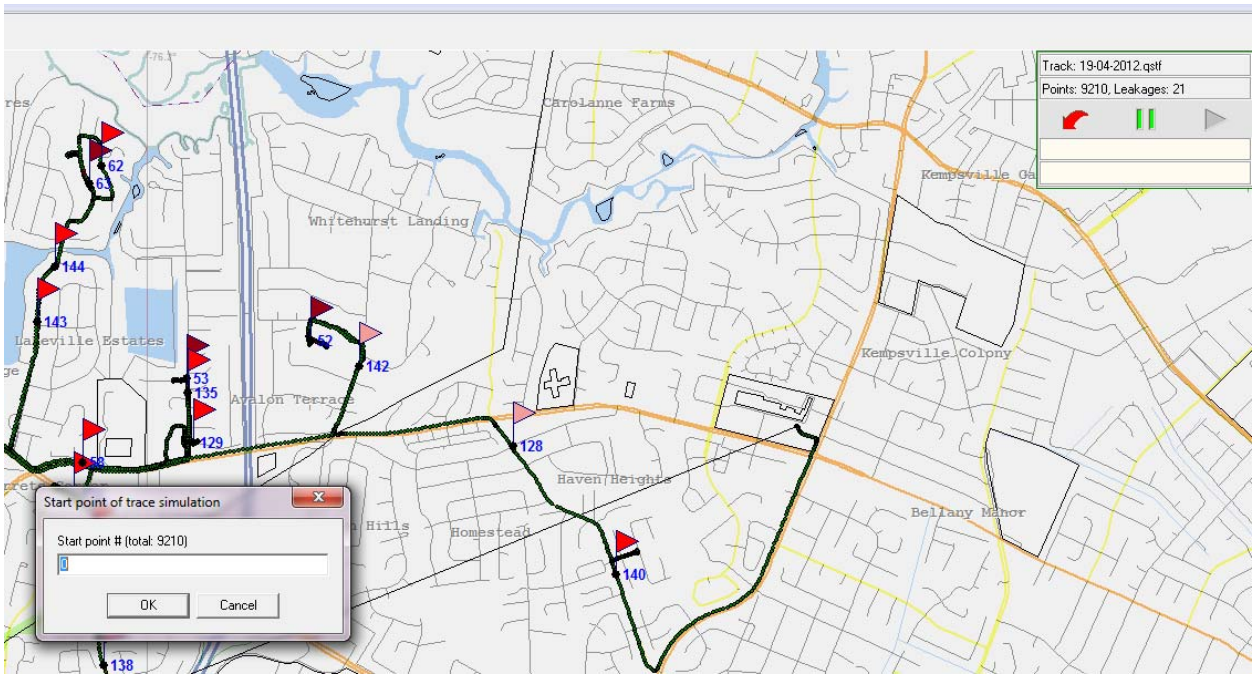
Navigate to the QAM Snare folder in Documents – this folder was created during the program installation process. The driving route will then be displayed.

Simulate downloaded driving routes

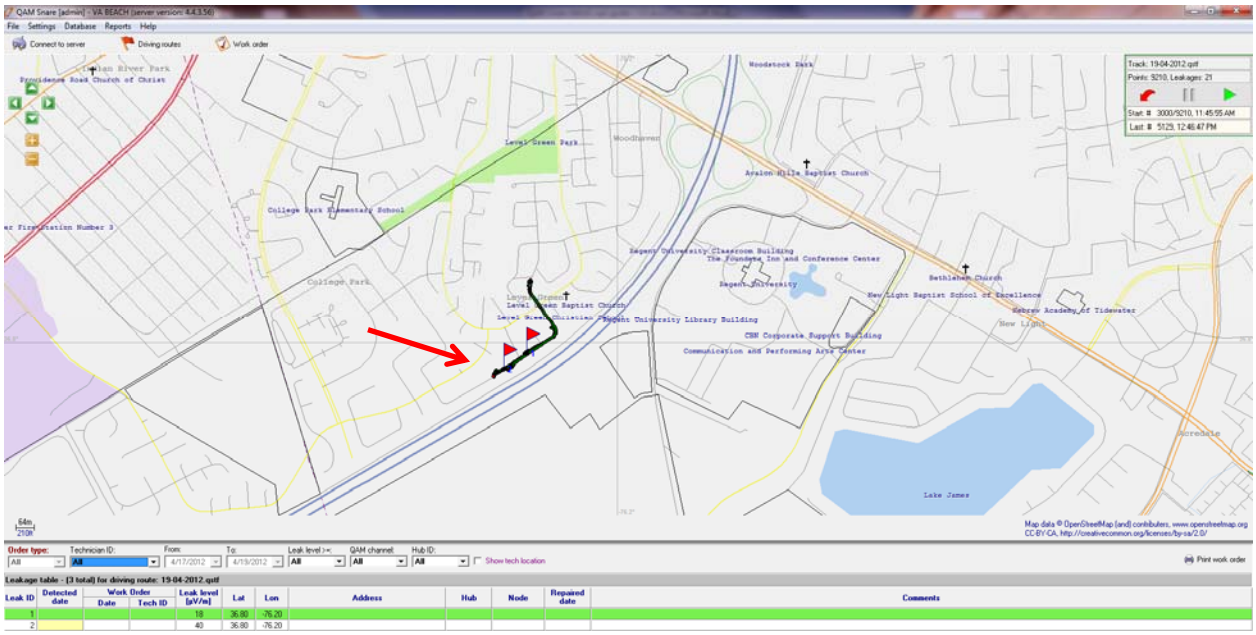
Previously downloaded driving routes can be viewed and reproduced point by point. After confirming yes, navigate to the QAM Snare Manager folder where the driving traces are stored (this folder was created upon setup). Then further navigate to the desired Device ID and select the QAM Snare trace file from the list.



The user can select which of the data points to start running the simulation. Press the right arrow to start the simulation, the pause button to pause, and the red downward arrow to reset.



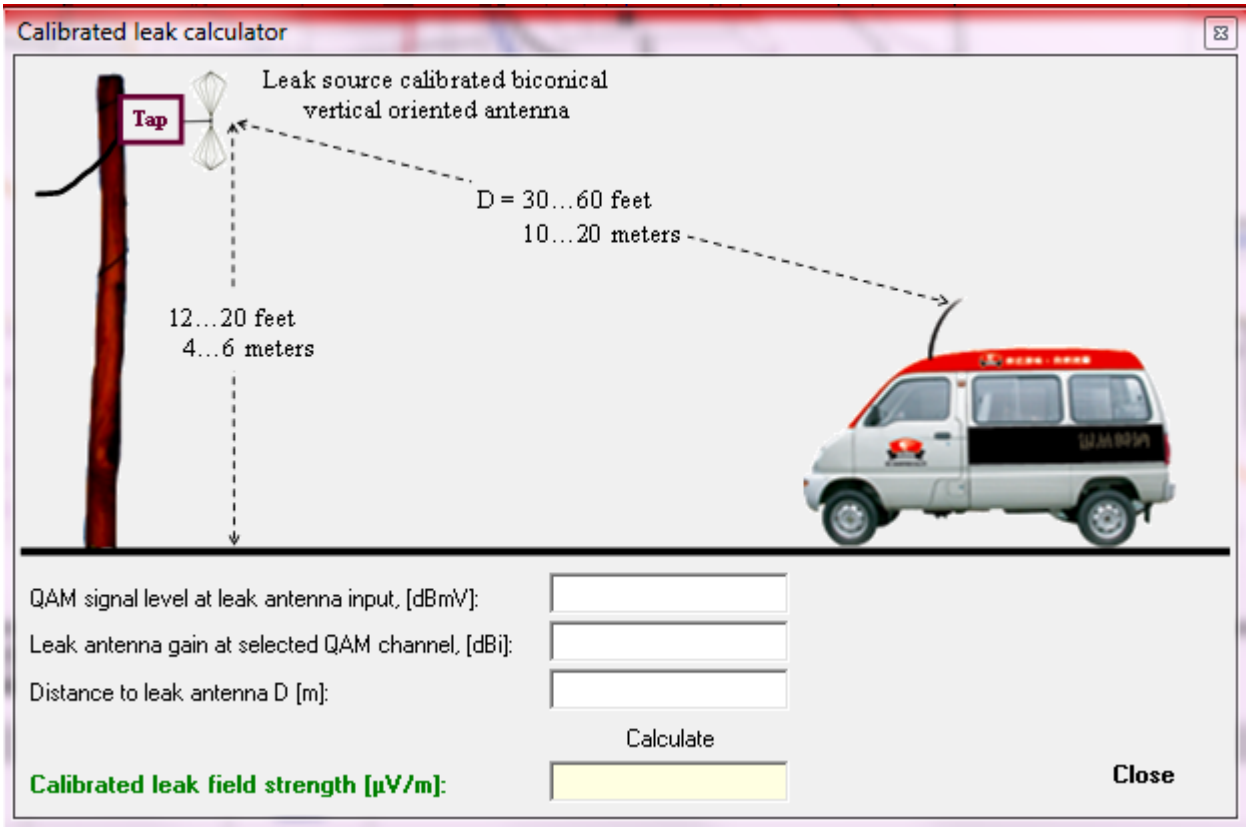
The moving drive path is indicated as shown below, data points are continually added.



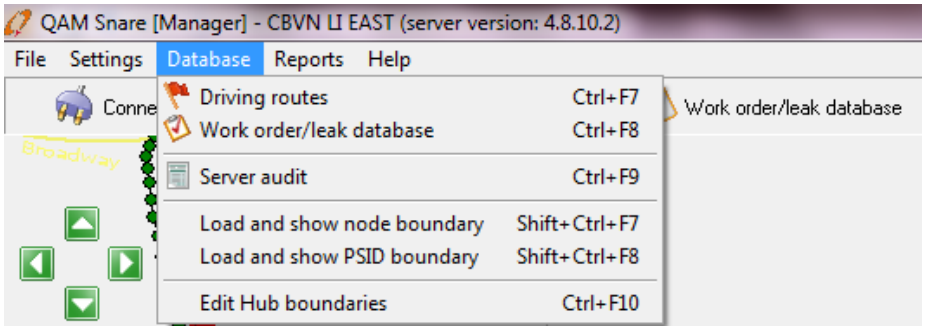
Right clicking on any of the drive path points will provide information on what was detected at that specific point as shown below.

Calibrated leak calculator

The calibrated leak calculator is a tool that is used to help determine the characteristics of a calibrated leak when using an antenna with a known gain. Enter the QAM signal level, antenna gain at desired frequency, and the distance to the receive antenna – and the calibrated leak field strength can be determined. Differences between this number and the number that the Navigator or Monitor measures can be used to calculate calibration coefficients for the field device.



Database

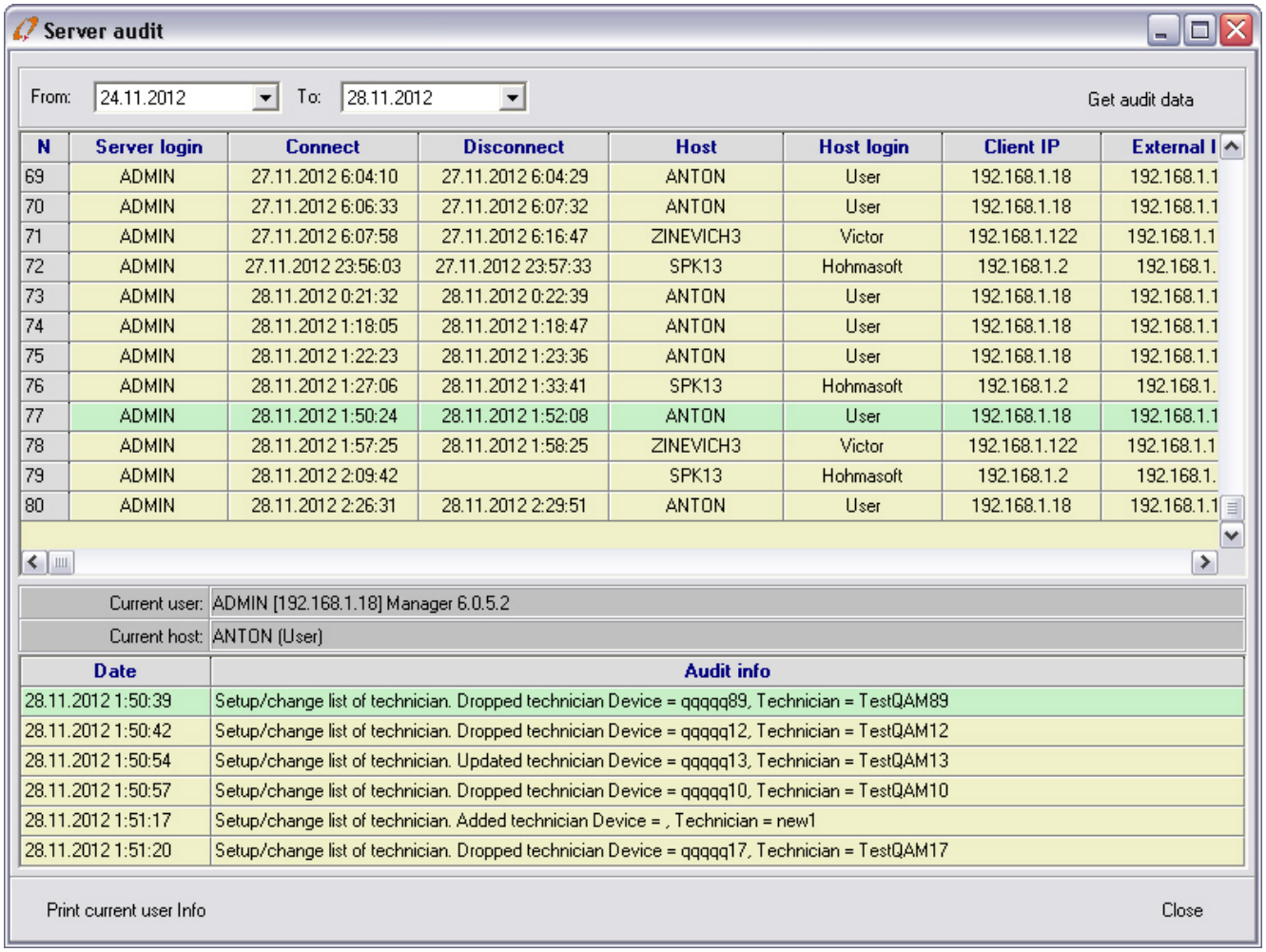


The database menu item provides alternative access to Driving routes and the Work order and leak database. It also provides access to the Server audit, and provides a way to view node and PSID boundaries on the maps. It additionally provides a way to Edit Hub/Node boundaries.

Server audit

QAM Snare contains many audit features that can monitor activity associated with the database.

After the Server audit button is pressed the Server audit window opens.



To access audit data, first enter the date range and press get Audit data.

Pressing on any of the Server logins will display information related to the sign-on, and software version of the QAM Snare Manager.

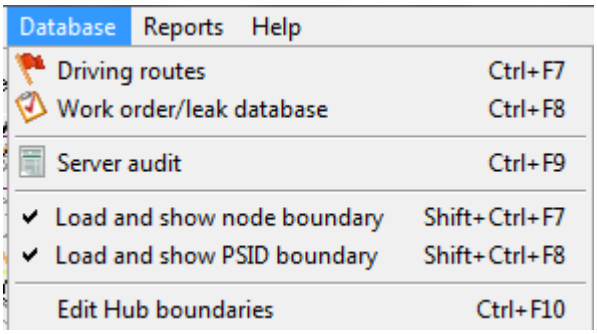
Current user:	ADMIN [192.168.1.18] Manager 6.0.5.2
Current host:	ANTON (User)

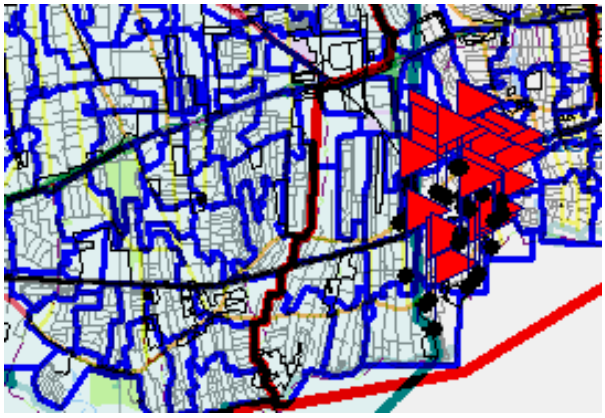
Information on what the particular user did during the session will be displayed on the lower window. If no database actions occurred then the lower portion of the screen will be blank.

Date	Audit info
28.11.2012 1:50:39	Setup/change list of technician. Dropped technician Device = qqqqq89, Technician = TestQAM89
28.11.2012 1:50:42	Setup/change list of technician. Dropped technician Device = qqqqq12, Technician = TestQAM12
28.11.2012 1:50:54	Setup/change list of technician. Updated technician Device = qqqqq13, Technician = TestQAM13
28.11.2012 1:50:57	Setup/change list of technician. Dropped technician Device = qqqqq10, Technician = TestQAM10
28.11.2012 1:51:17	Setup/change list of technician. Added technician Device = , Technician = new1
28.11.2012 1:51:20	Setup/change list of technician. Dropped technician Device = qqqqq17, Technician = TestQAM17

Load and show node boundary

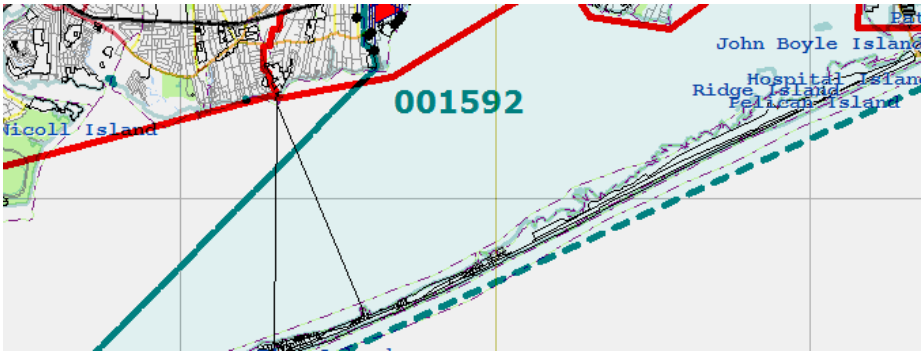
To display node boundaries, click on the Load and show node boundary text, or press the displayed hot key sequence. Node boundaries will be displayed. When you hover over a node with your mouse, the node ID will be displayed. If node boundaries do not exist, then the Load and show node boundary line will not be displayed.





Load and show PSID boundary

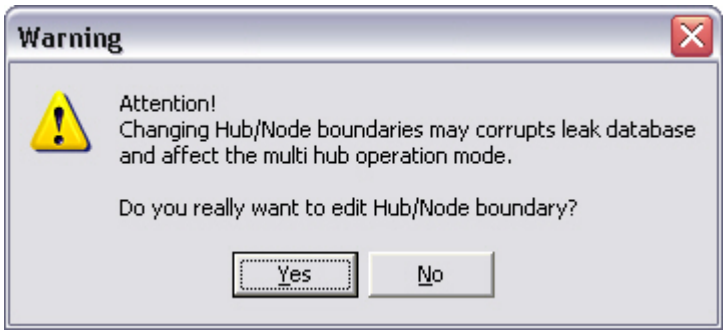
To display PSID boundaries, click on the Load and show PSID boundary text or press the displayed hot key sequence. The PSID number will be displayed when you hover over and area with your mouse.



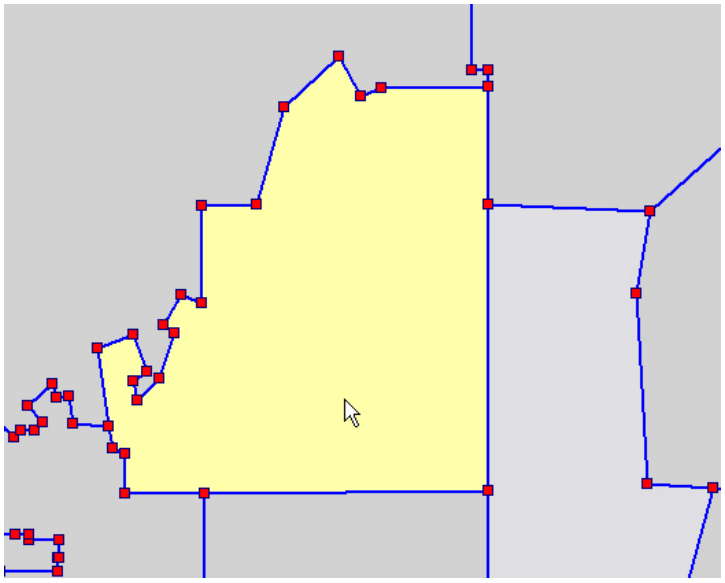
Edit Hub/Node boundaries

Hub and node boundaries can be configured by Arcom Digital if electronic maps are supplied. Additionally, hub and node boundaries can be manually changed.

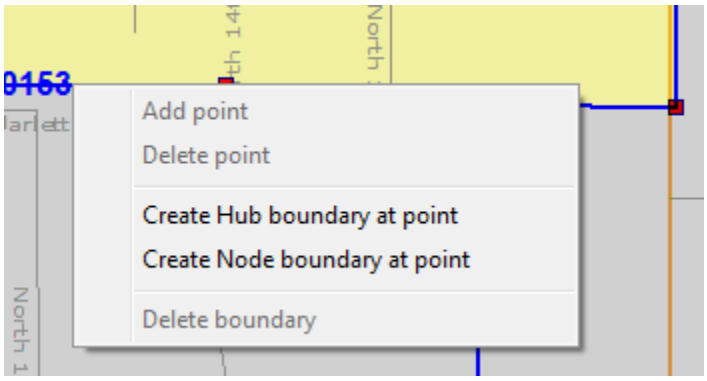
After clicking on the Edit Hub/Node boundaries button, a Warning message will appear, indicating that if not done properly, that the database may become corrupt and that it could affect the multi hub operating mode. If you want to continue, press yes – if you are unsure as to the process press No and contact your Arcom Digital representative for guidance.



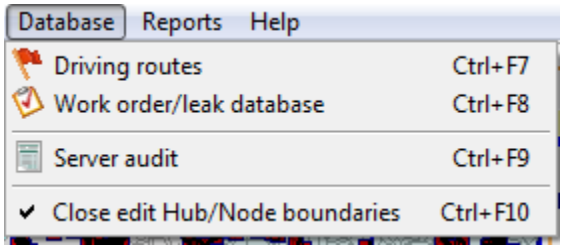
After answering yes, the existing hubs and node map will open in edit mode, with all the boundary inflection points highlighted with a red square.



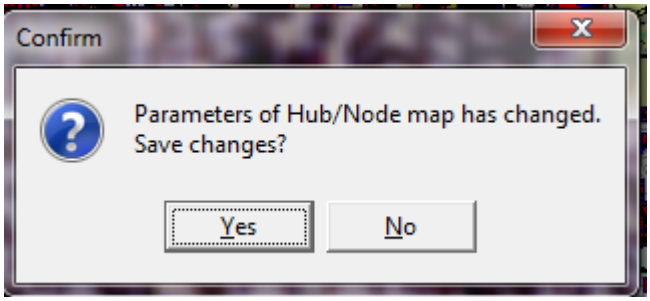
Right click on the desired point to want to change and a menu item appears.



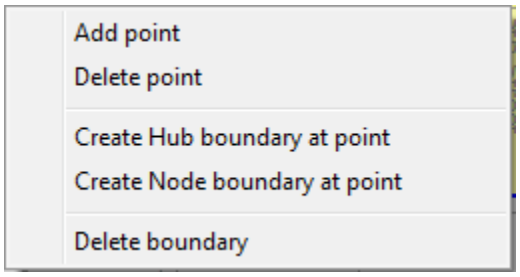
When the task is completed and the changes are made, you need to exit Edit mode. Click Database – Close edit Hub/Node boundaries.



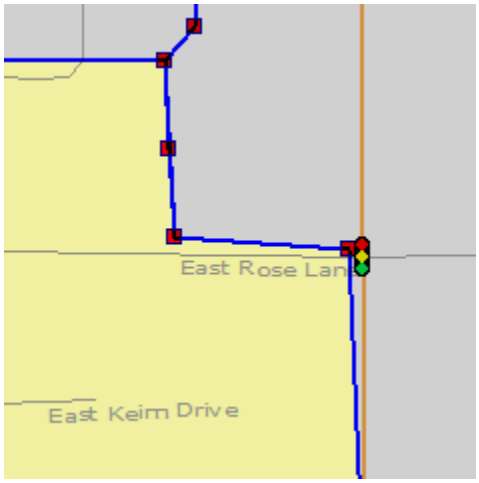
A Confirm Window will appear asking if you wish to save changes.



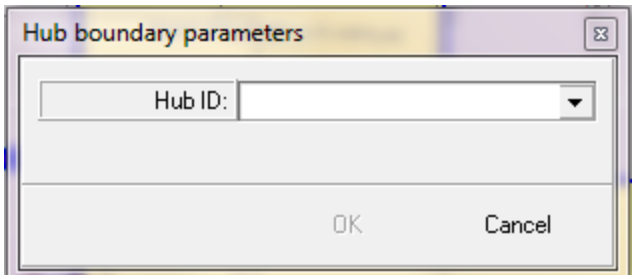
To change existing boundaries, after entering the edit mode, go to the map location where you wish to make changes, and right click to access the Edit menu items, and select the desired task.



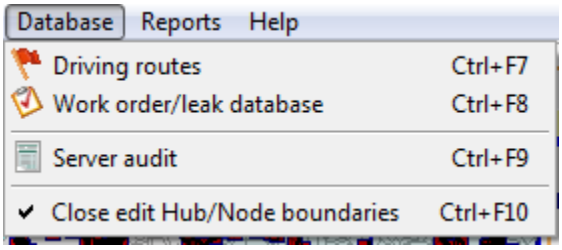
When you select Add point, a new data point in the form of a red box will be created midpoint adjacent to the selected line and data point. This new data point can be dragged to the desired position. This process can be repeated until the boundary is of the desired shape in the desired location.



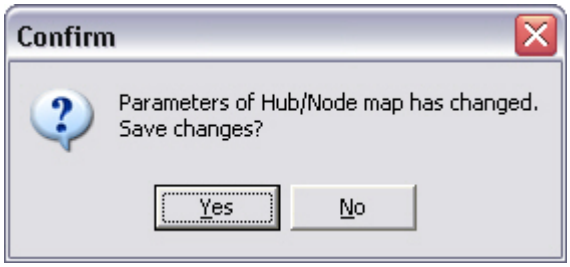
To create a Hub boundary at the cursur loction, click Create Hub boundary. You will be asked for the Hub ID which must be selected from the list. If the Hub name is not present, it must be first created in Settings – List of Hubs.



After adding the hub boundaries, and creating the desired shape by adding data point and dragging to the desired location, you need to save the changes. This is accomplished by going into Database – close Edit Hub/Node boundaries.

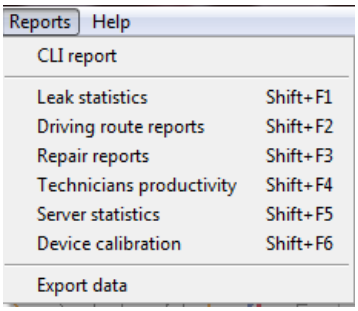


And Confirming that you want to Save the changes.



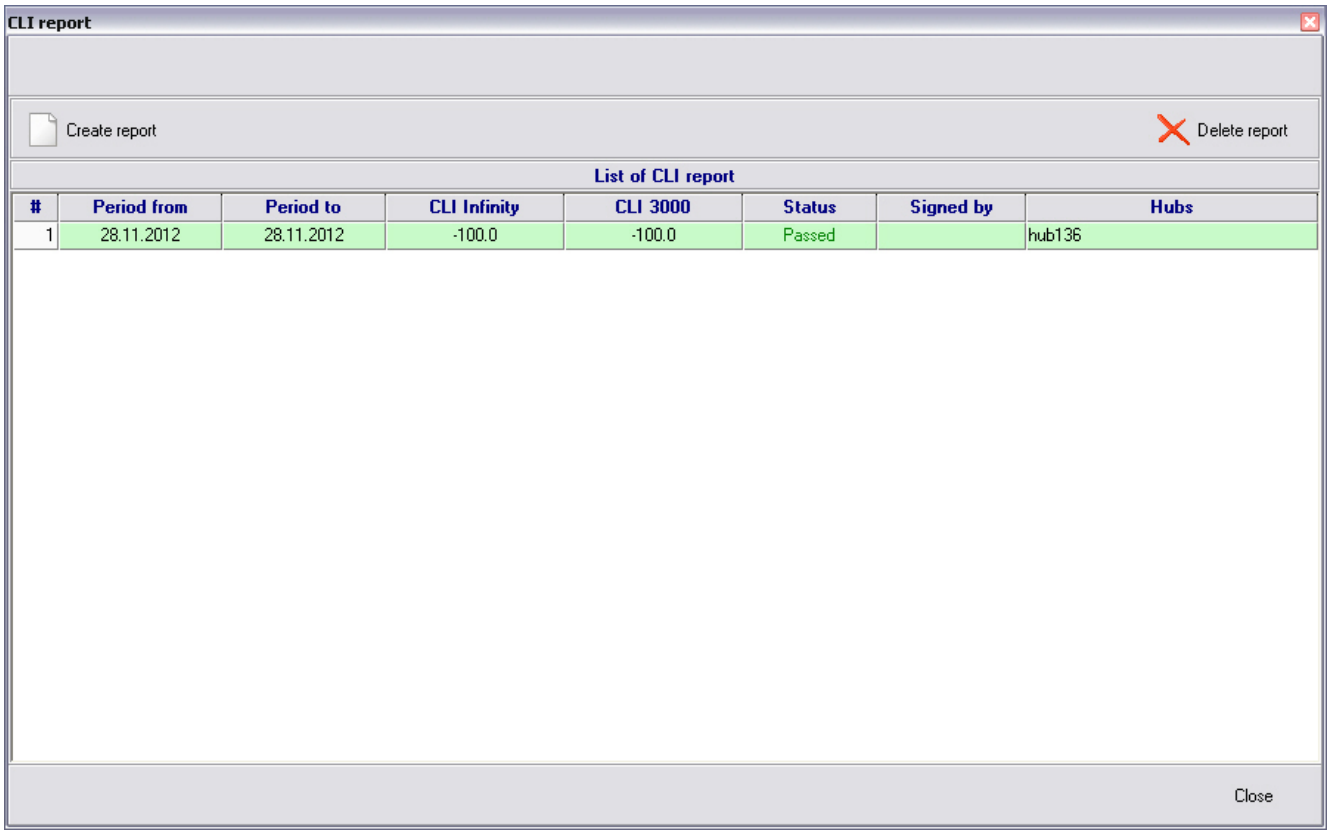
Reports

QAM Snare provides many useful reporting features, the capabilities of which will be expanded over time.

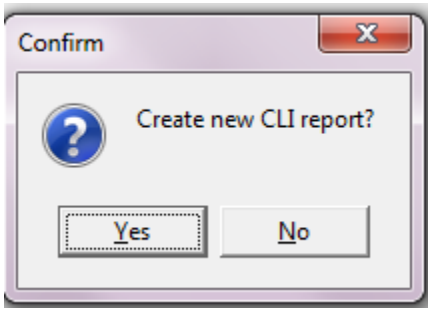


CLI report

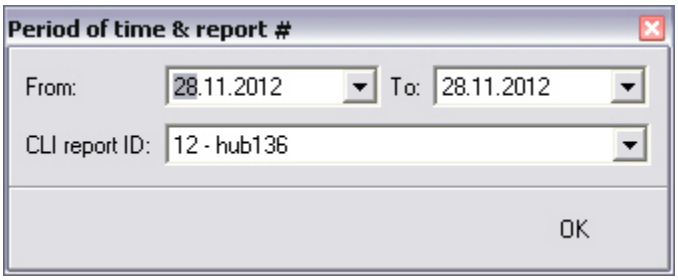
To create a CLI report, press Create report.



A window will appear asking if you want to create a new report.

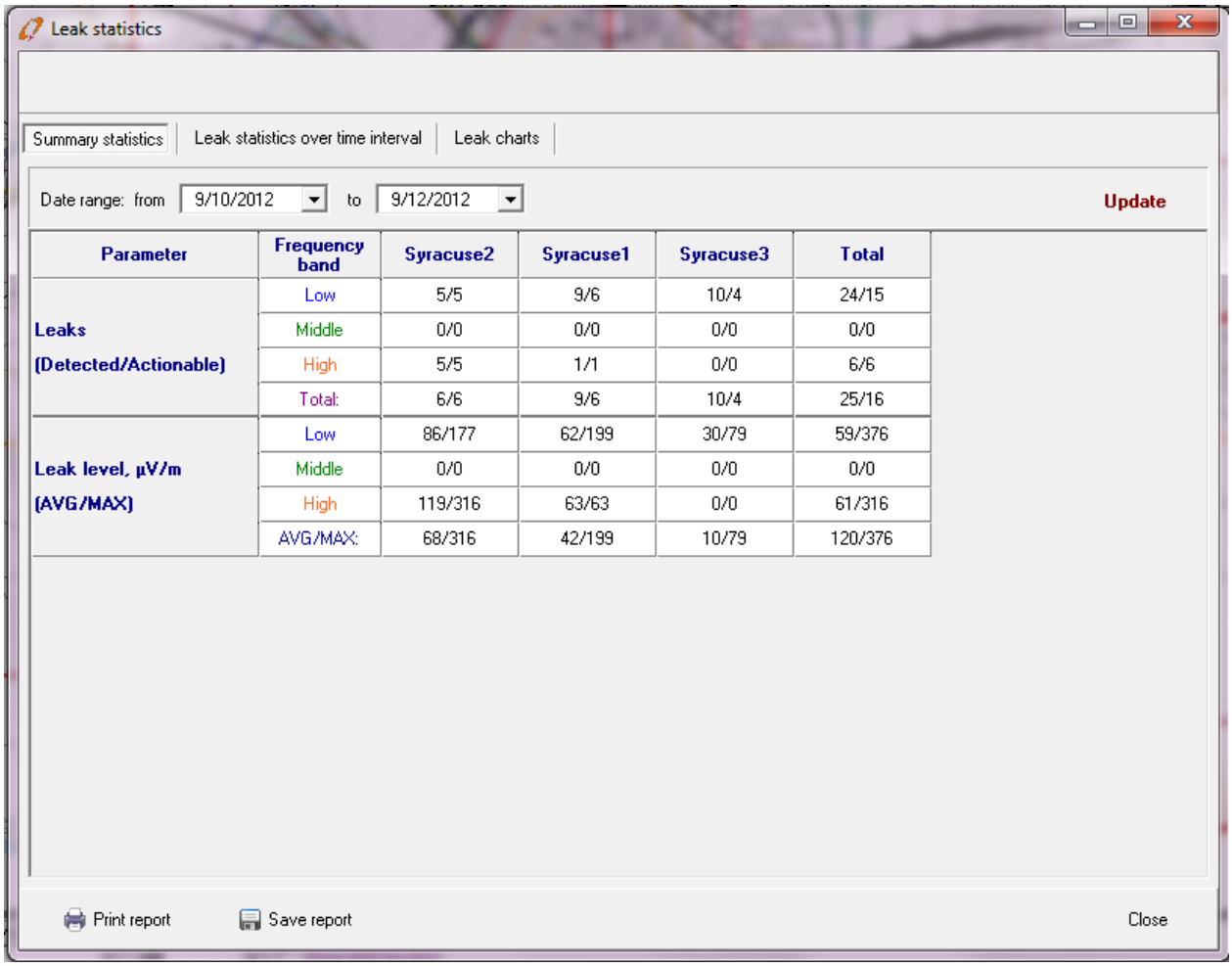


And then it will request the time range and the CLI report ID which is selectable from the drop down list. The name of the report is configured in Settings – List of Hubs.



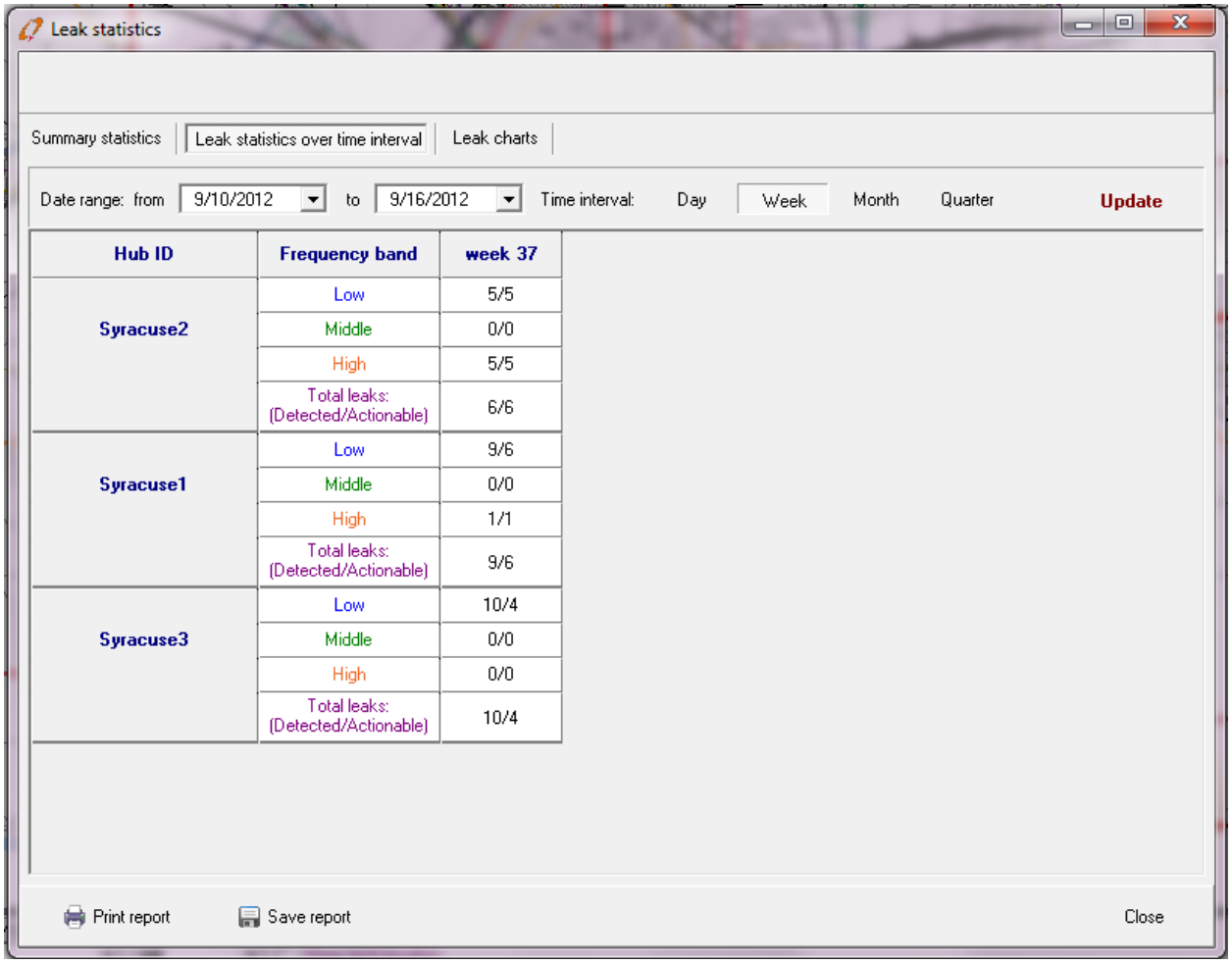
Leak statistics

Summary statistics – provides information by hub for a given date range, for the number of leaks in each band and level. Leak information is provided as to the number of detected leaks, and the number of leaks that are actionable. An actionable leak is one that according to parameters established in Work Orders, needs to be fixed.

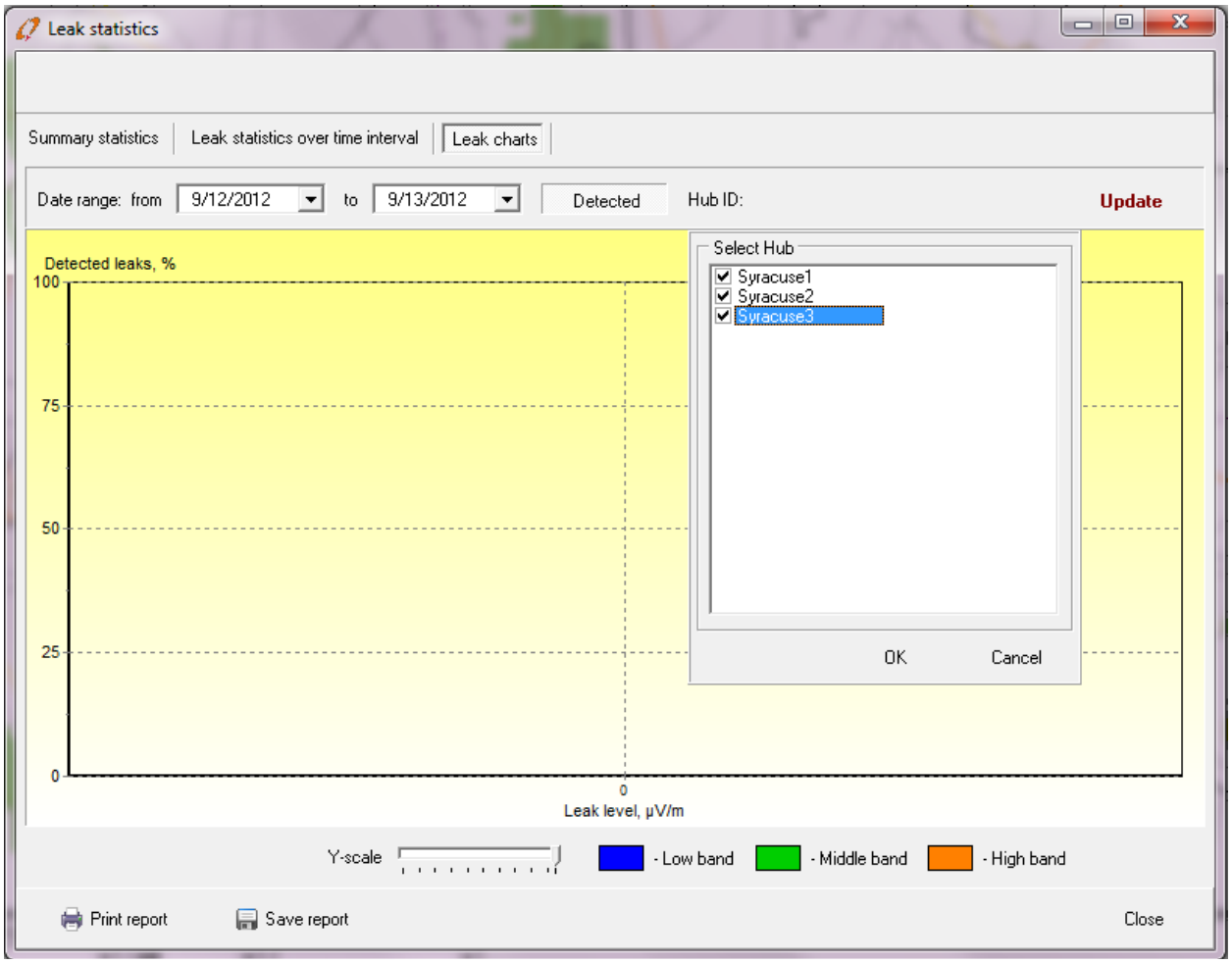


Parameter	Frequency band	Syracuse2	Syracuse1	Syracuse3	Total
Leaks (Detected/Actionable)	Low	5/5	9/6	10/4	24/15
	Middle	0/0	0/0	0/0	0/0
	High	5/5	1/1	0/0	6/6
	Total:	6/6	9/6	10/4	25/16
Leak level, µV/m (AVG/MAX)	Low	86/177	62/199	30/79	59/376
	Middle	0/0	0/0	0/0	0/0
	High	119/316	63/63	0/0	61/316
	AVG/MAX:	68/316	42/199	10/79	120/376

Leak statistics over time interval– displays the number of detected and actionable leaks by Day, Week, Month, or Quarter for any Date range. It is a good way to look at trends.

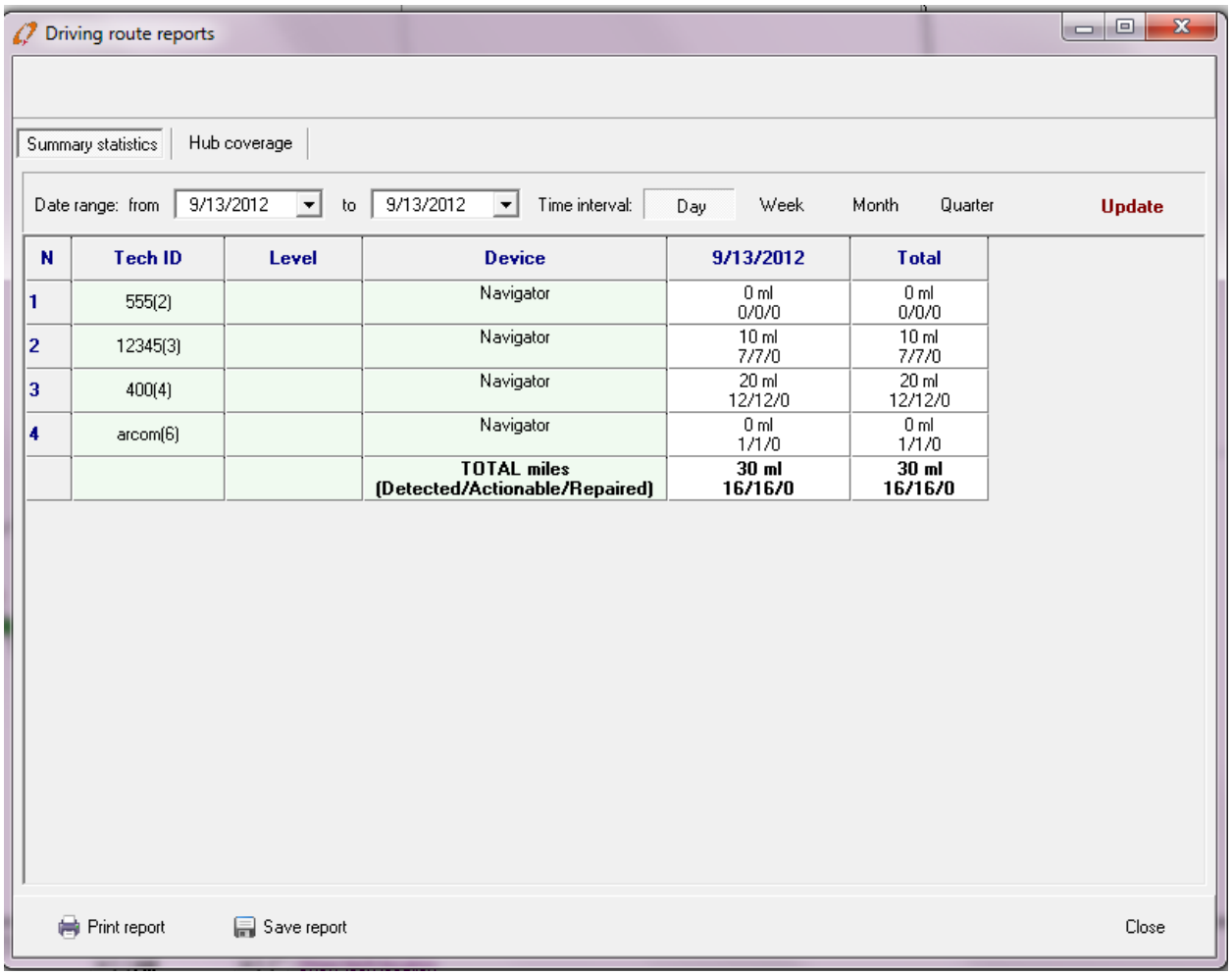


Leak charts– enter date range, press on Detected to toggle to Actionable, press Hub ID, check hubs you would like to see charts on – and press update

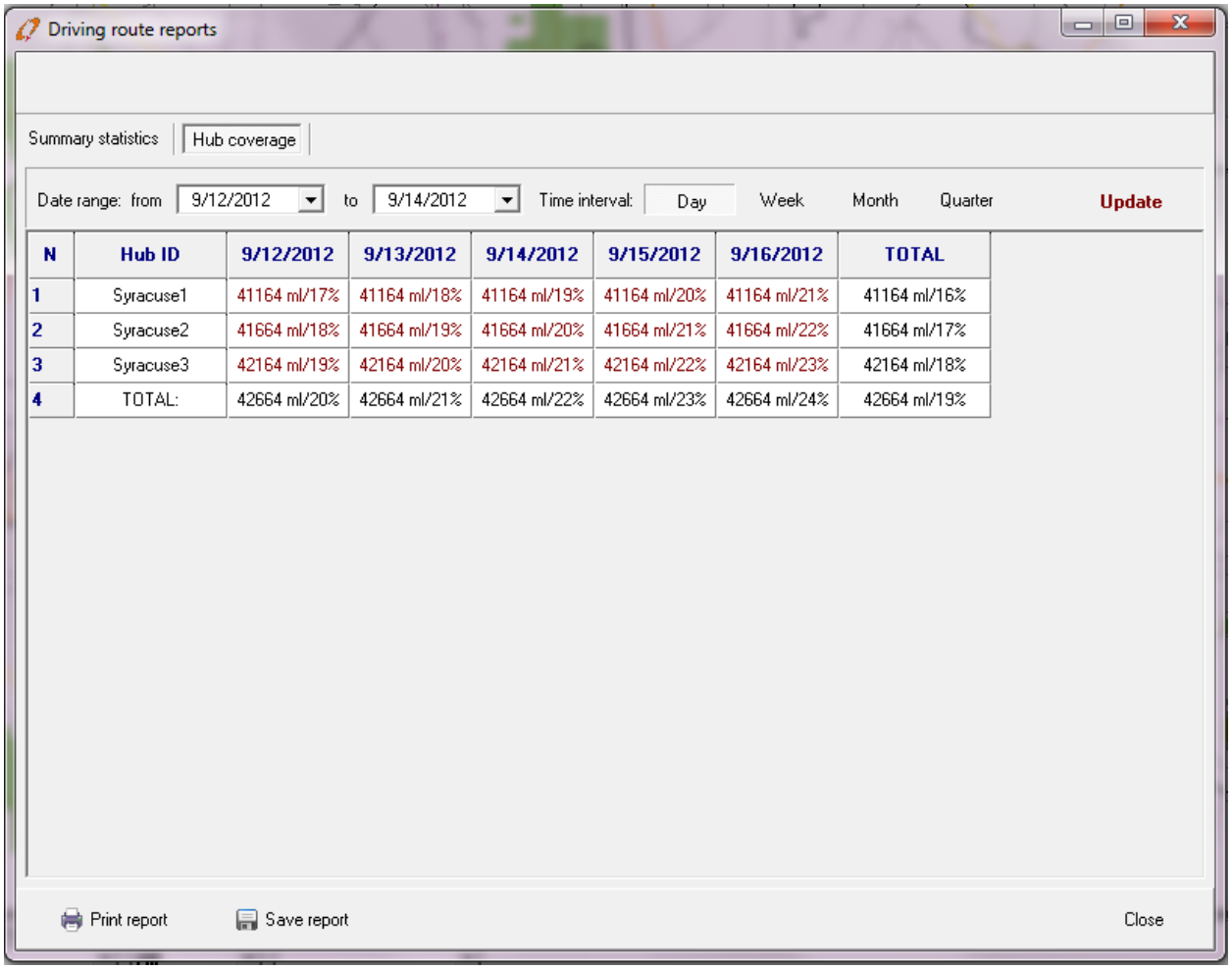


Driving route reports

Summary Statistics – Provides the number of miles driven for each field device, by Day, Week, Month, or Quarter– within a selected date range. For each Tech ID it also provides information as to the number of (Detected/Actionable/Repaired) leaks for the selected period.



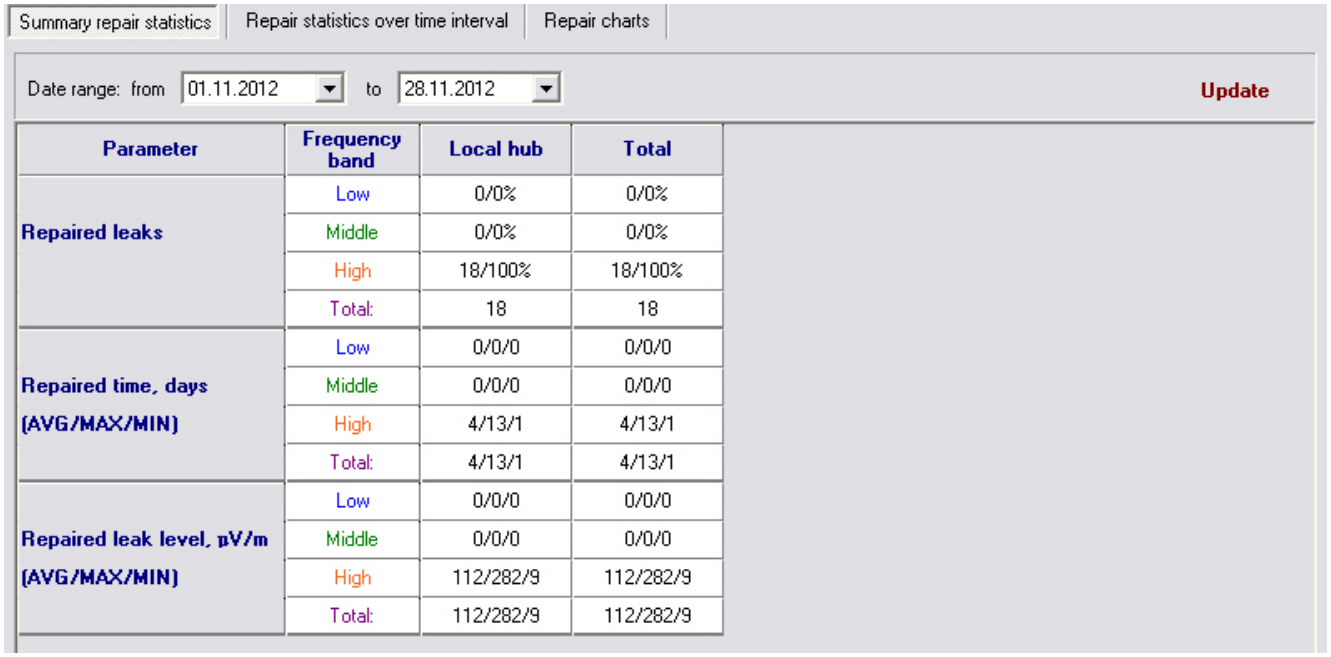
Hub Coverage – shows the percentage of total miles driven versus the total number of hub miles. The hub miles number comes from the value entered in System settings-list of hub-plant miles for the hub.



N	Hub ID	9/12/2012	9/13/2012	9/14/2012	9/15/2012	9/16/2012	TOTAL
1	Syracuse1	41164 ml/17%	41164 ml/18%	41164 ml/19%	41164 ml/20%	41164 ml/21%	41164 ml/16%
2	Syracuse2	41664 ml/18%	41664 ml/19%	41664 ml/20%	41664 ml/21%	41664 ml/22%	41664 ml/17%
3	Syracuse3	42164 ml/19%	42164 ml/20%	42164 ml/21%	42164 ml/22%	42164 ml/23%	42164 ml/18%
4	TOTAL:	42664 ml/20%	42664 ml/21%	42664 ml/22%	42664 ml/23%	42664 ml/24%	42664 ml/19%

Repair reports

Summary repair statistics– Provides high level information on leaks repaired (closed) by hub for a given date range. Includes the number of repaired leaks, repair time, and repair level. Enter desired date range and press Update.

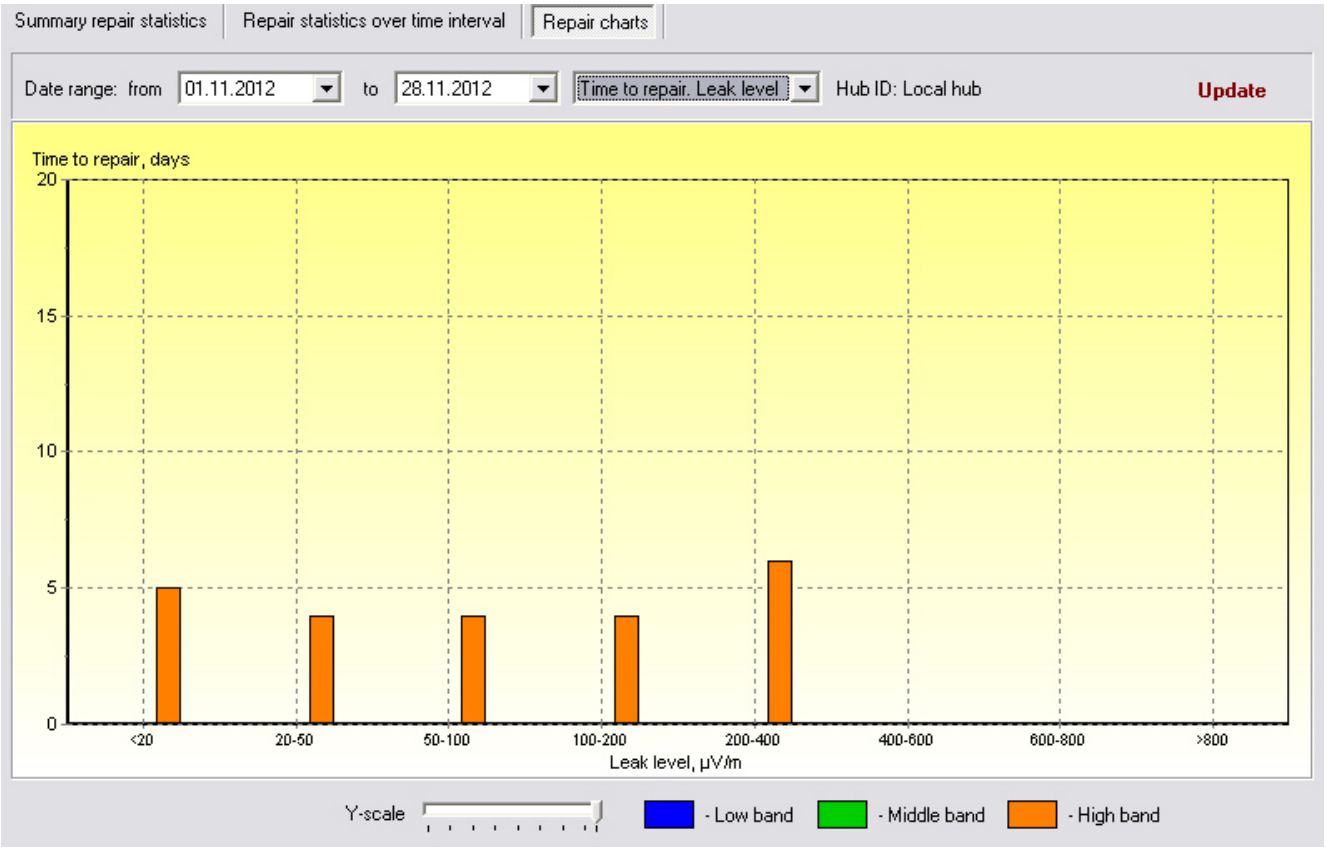


Parameter	Frequency band	Local hub	Total
Repaired leaks	Low	0/0%	0/0%
	Middle	0/0%	0/0%
	High	18/100%	18/100%
	Total:	18	18
Repaired time, days (AVG/MAX/MIN)	Low	0/0/0	0/0/0
	Middle	0/0/0	0/0/0
	High	4/13/1	4/13/1
	Total:	4/13/1	4/13/1
Repaired leak level, µV/m (AVG/MAX/MIN)	Low	0/0/0	0/0/0
	Middle	0/0/0	0/0/0
	High	112/282/9	112/282/9
	Total:	112/282/9	112/282/9

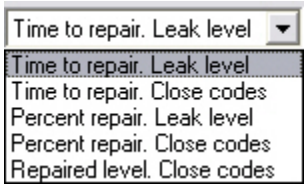
Repair statistics over time interval – shows the number of leaks repaired over a time interval.

Hub ID	Frequency band	09.11.2012	16.11.2012	19.11.2012	20.11.2012	21.11.2012
Local hub	Low	0	0	0	0	0
	Middle	0	0	0	0	0
	High	2	4	3	7	2
	Total leaks:	2	4	3	7	2

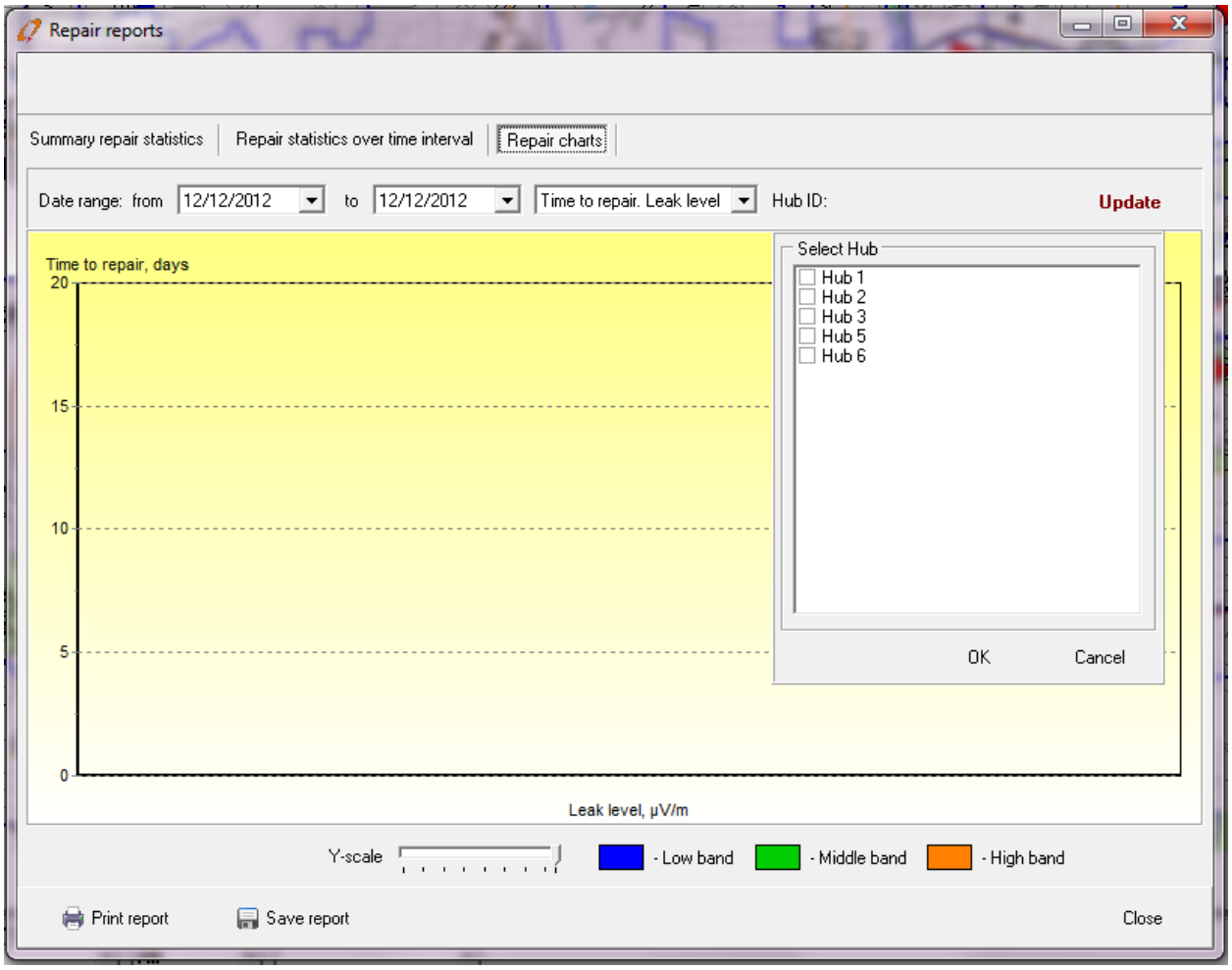
Repair charts – provides a graphical representation of various leakage parameters.



First select the desired date range. Then select the type of chart from the drop down list.



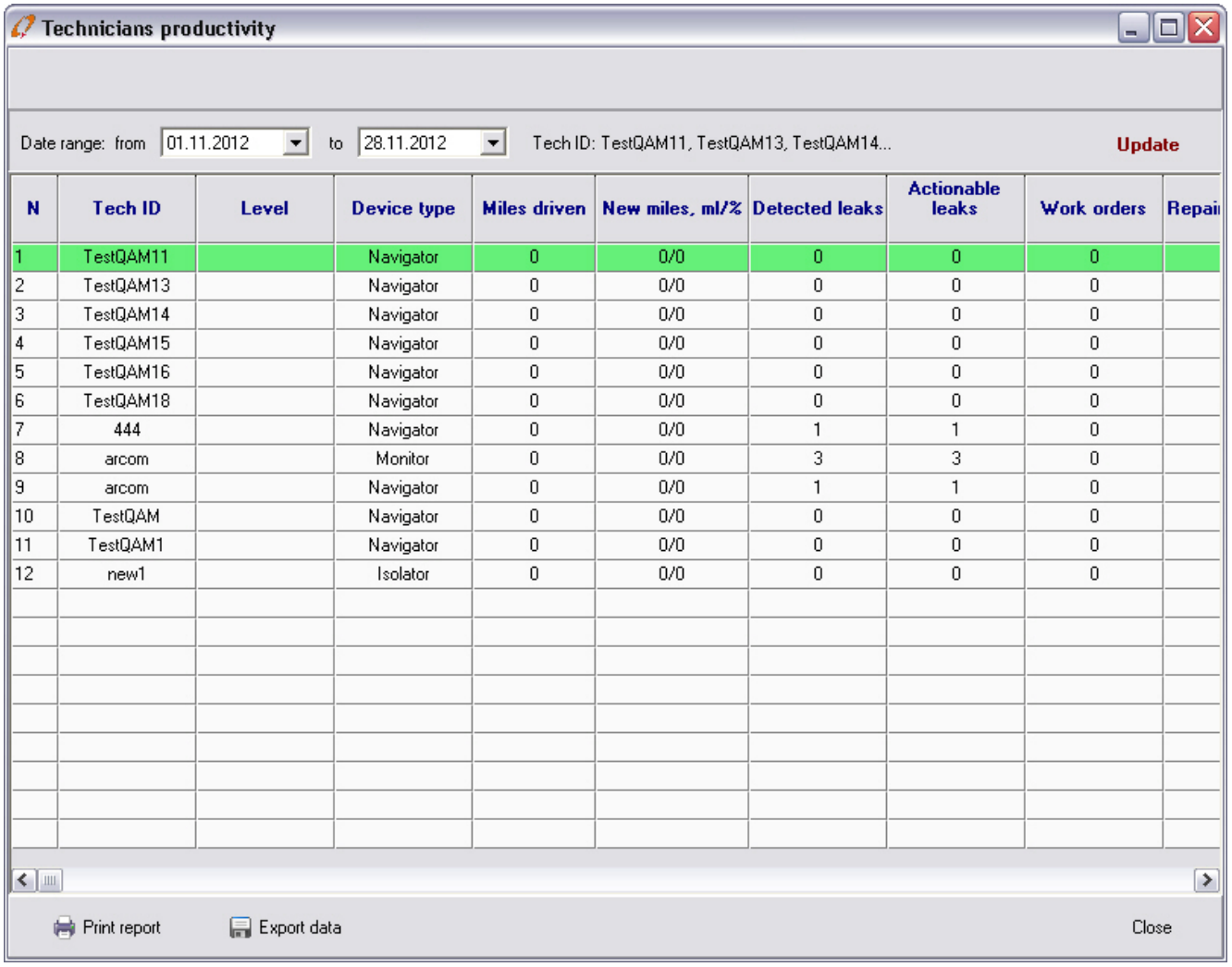
Click on the work “Hub ID”, and a Hub selection window will appear.



After making selection of Hub(s), press OK, and then press Update to update the chart. The Y-scale can be adjusted by moving the slide cursor at the bottom of the graph.

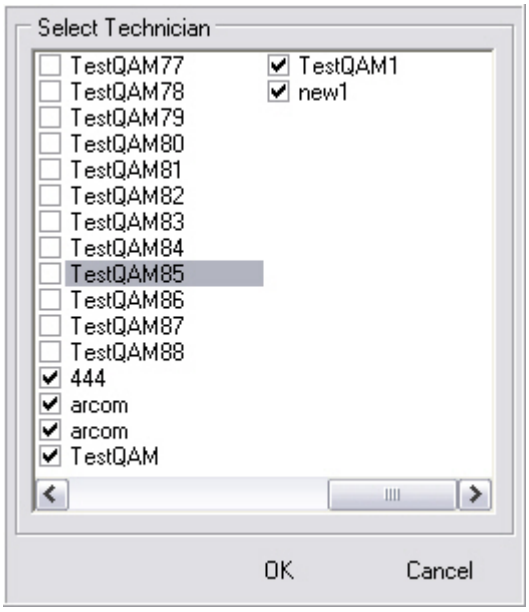
Technicians productivity

The Technicians productivity report provides information as to what technicians are doing in the field. It shows miles driven, new miles driven, the number of detected and actionable leaks, and the number of work orders assigned and repaired.



N	Tech ID	Level	Device type	Miles driven	New miles, mi/%	Detected leaks	Actionable leaks	Work orders	Repai
1	TestQAM11		Navigator	0	0/0	0	0	0	
2	TestQAM13		Navigator	0	0/0	0	0	0	
3	TestQAM14		Navigator	0	0/0	0	0	0	
4	TestQAM15		Navigator	0	0/0	0	0	0	
5	TestQAM16		Navigator	0	0/0	0	0	0	
6	TestQAM18		Navigator	0	0/0	0	0	0	
7	444		Navigator	0	0/0	1	1	0	
8	arcom		Monitor	0	0/0	3	3	0	
9	arcom		Navigator	0	0/0	1	1	0	
10	TestQAM		Navigator	0	0/0	0	0	0	
11	TestQAM1		Navigator	0	0/0	0	0	0	
12	new1		Isolator	0	0/0	0	0	0	

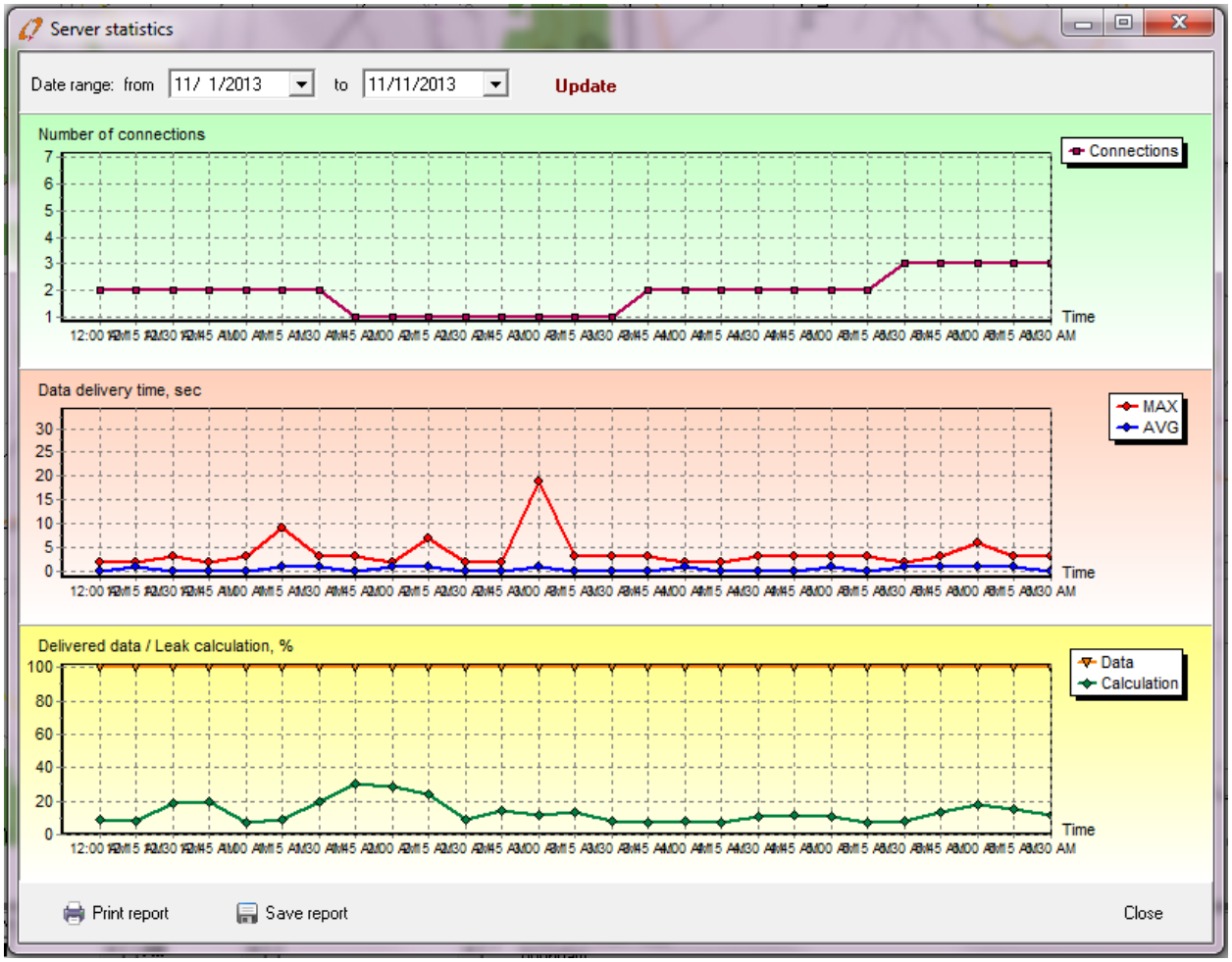
First select the date range and then click on the wording “Tech ID” to open the Select technician window.



After selecting the desired technician press OK, then Update.

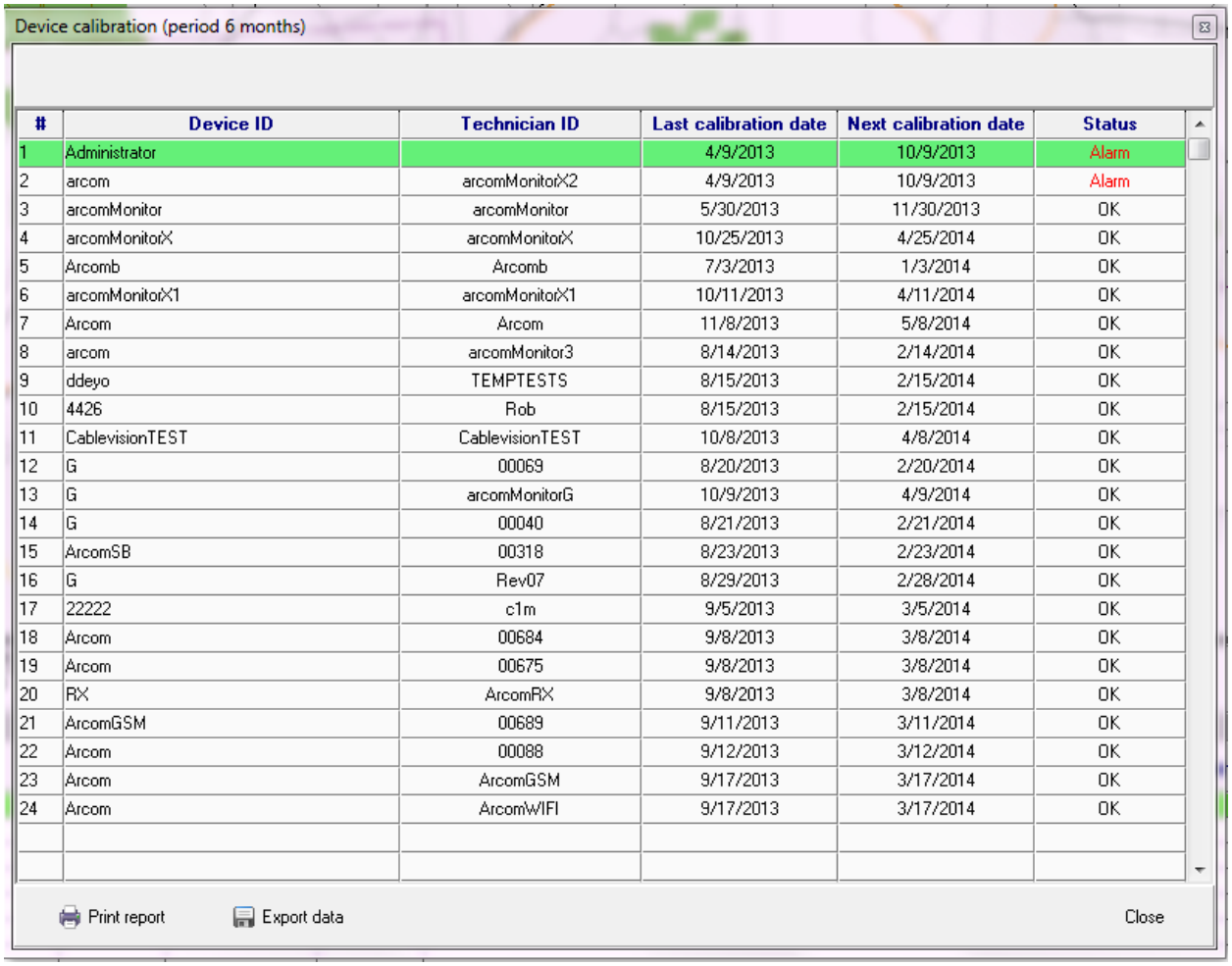
Server Statistics

Server Statistics provides information on performance of the server. When selecting the date range, **a maximum of 10 days of data can be displayed**. After selecting the desired date range press the Update button. The top 1/3 of the report shows the number of Navigators or Monitors that connected to the server. The middle third shows the average and max data delivery time from server to the field unit. The bottom 1/3 shows the percent of data successfully delivered from the server to the field unit as well as the leak calculation % which is a relative indication of how much of the computer resources are being utilized.



Device Calibration

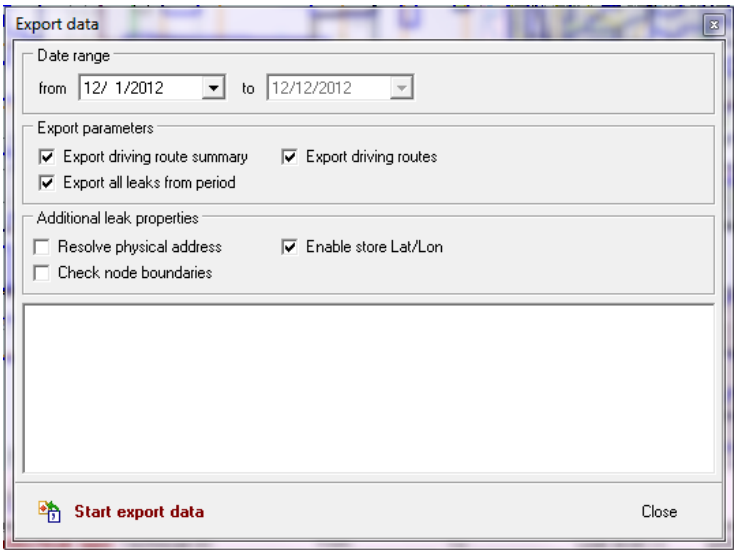
Device calibration provides a report showing last calibration date and when the next calibration is due for each device contained in List of Devices. The calibration due date can be changed in System Settings – Leak Detector – Device Calibration.



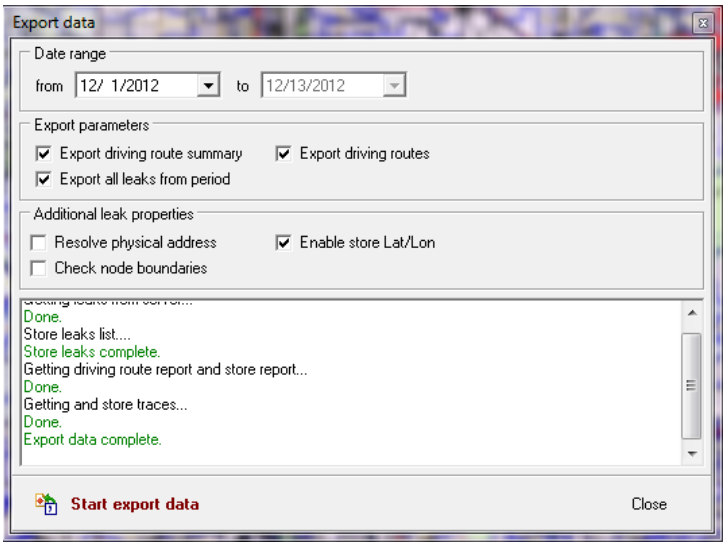
#	Device ID	Technician ID	Last calibration date	Next calibration date	Status
1	Administrator		4/9/2013	10/9/2013	Alarm
2	arcom	arcomMonitorX2	4/9/2013	10/9/2013	Alarm
3	arcomMonitor	arcomMonitor	5/30/2013	11/30/2013	OK
4	arcomMonitorX	arcomMonitorX	10/25/2013	4/25/2014	OK
5	Arcomb	Arcomb	7/3/2013	1/3/2014	OK
6	arcomMonitorX1	arcomMonitorX1	10/11/2013	4/11/2014	OK
7	Arcom	Arcom	11/8/2013	5/8/2014	OK
8	arcom	arcomMonitor3	8/14/2013	2/14/2014	OK
9	ddeyo	TEMPTESTS	8/15/2013	2/15/2014	OK
10	4426	Rob	8/15/2013	2/15/2014	OK
11	CablevisionTEST	CablevisionTEST	10/8/2013	4/8/2014	OK
12	G	00069	8/20/2013	2/20/2014	OK
13	G	arcomMonitorG	10/9/2013	4/9/2014	OK
14	G	00040	8/21/2013	2/21/2014	OK
15	ArcomSB	00318	8/23/2013	2/23/2014	OK
16	G	Rev07	8/29/2013	2/28/2014	OK
17	22222	c1m	9/5/2013	3/5/2014	OK
18	Arcom	00684	9/8/2013	3/8/2014	OK
19	Arcom	00675	9/8/2013	3/8/2014	OK
20	RX	ArcomRX	9/8/2013	3/8/2014	OK
21	ArcomGSM	00689	9/11/2013	3/11/2014	OK
22	Arcom	00088	9/12/2013	3/12/2014	OK
23	Arcom	ArcomGSM	9/17/2013	3/17/2014	OK
24	Arcom	ArcomWIFI	9/17/2013	3/17/2014	OK

Export Data

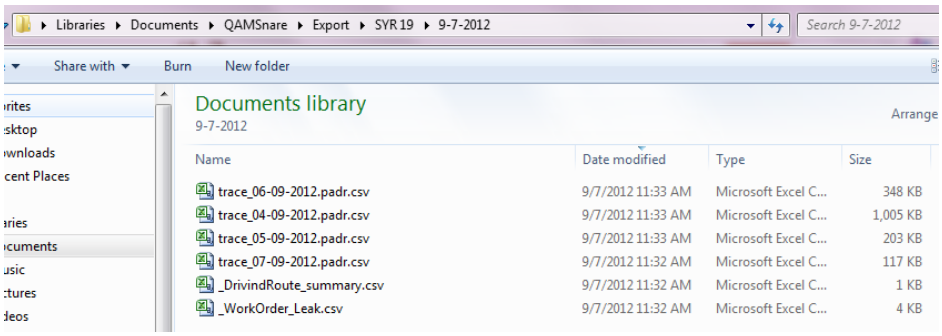
The export data application provides an easy method to port data to other applications. Select the date range and press the Export data button.



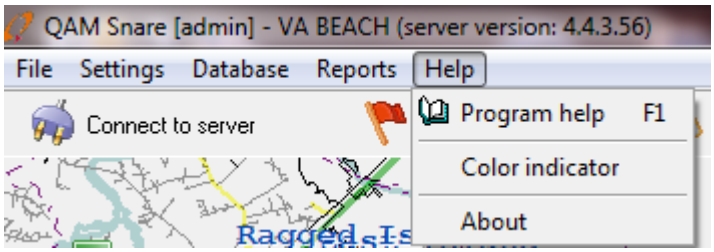
You will see those files that are being exported, and will receive a confirmation message when the export is complete.



Data is stored in the QAM Snare Directory in Documents/Export/Server name/Date. Format is .CSV which excel can easily parse.



Help

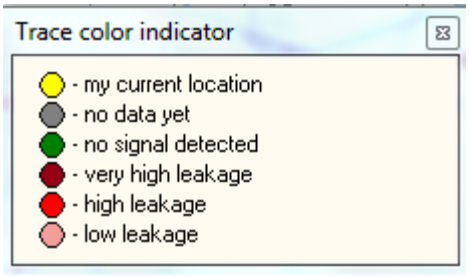


Program help

Program help is available by pressing F1 on any screen.

Color indicator

A pallet showing colors used for leak indication is shown here.

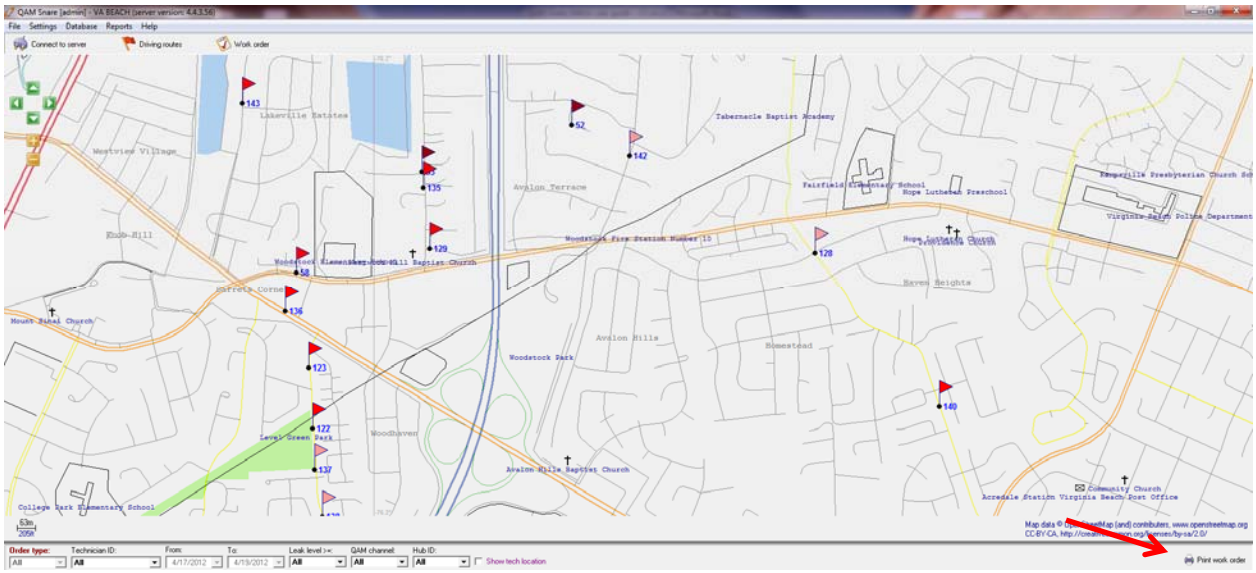
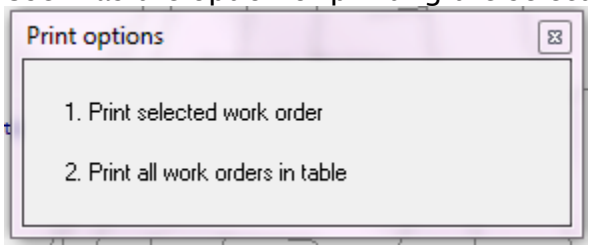


About

About provides information on the software version and license.

Print work order

Work orders and information on detected leaks can be printed by clicking on the Print work order button at the bottom right of the screen.



User has the option of printing the selected work order or all work orders.